Impact of Information Acquisition Costs on Voting Choices

An experimental study on information acquisition and ideological distances

Master's Thesis

Theodora Järvi

Master's Degree Programme in Public Choice

Faculty of Social Sciences

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Author: Theodora Järvi

Supervisor: Prof. Katri Sieberg

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Abstract

Individual decision-making and its applications have been of scientific interest for a long time. Decision-making is central to behaviour and can have multiple stages and contexts. This thesis looks at voting behaviour with a focus on the very initial stages of choice-making. The aim is to investigate how influential information acquisition and the related costs are to a personally rational decision – one in which the individual chooses a representative for themselves that best complements their ideological views. This thesis takes the unique viewpoint of a multiparty setting and adapts mathematical models to quantify the different variables associated with voting choices. To build a fuller representation of how these information acquisition costs influence choices, a pilot laboratory experiment is conducted. The results obtained suggest that information acquisition is highly influential to the outcomes of voting and needs to be well balanced, as information enhances the gains from voting, but the costs from acquiring information can have a negative impact on the outcome. Additionally, it is found that the initial information an individual possesses guides their further desire to look for information. This study concludes that there seems to be a need to study the issue further to better understand how decisions are made in a multiparty system and how information affects these decisions.

Keywords

Voting behaviour, correct voting, rational voting, information acquisition, information acquisition costs, utility maximization, ideological distances

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1. Introduction

Voting behaviour has long been of interest to researchers. Already in 1959 Lipset looked at how voters made "rational electoral choices" (Lipset, 1959, p.79). In the words of Markus and Converse (1979, p. 1056) "(r)ationality refers to the notion of minimizing expected loss", where in a voting context loss is stated to be either of personal or policy-related character. Nowadays it is presumed people make these kinds of rational choices because we live in an era where there is easy access to an abundance of information. A wide spread of research (for example Larcinese (2007), Strömbäck (2008)) has investigated how different outlets present information about candidates, especially in election times. Some (such as Larcinese (2009), Triossi (2013)) have studied how people strategize their vote in order to gain the most out of voting. Additionally, the literature on voter turnout is extensive (Gallego, 2010; Citrin, Schickler & Sides, 2003; Ghosal and Lockwood, 2009; among others). However, not so much attention has been paid to the very early stages of voter decision-making – the one in which the voter decides whether they are interested in knowing something about the candidate they would choose or whether they are interested in voting at all. Moreover, the majority of voting research has concentrated on the dual-party system, mainly in the context of the United States of America or Great Britain (e.g. Dalton, 2008; Gallego, 2010; Citrin, et al., 2003; Hillygus, 2005; Jessee, 2010; Lau and Redlawsk, 1997; Larcinese, 2007).

This thesis concentrates on the initial stage of voting, the one before going to the polling station or even before the formation of a voting strategy. It aims to take information acquisition and the related costs – the non-monetary costs of time and effort when looking for and processing information about candidates, policies and current performance of the government - as the main variables driving any initial decision-making process and investigate the influence of information acquisition and the related costs on the rationality of voting. It should be noted that for the purposes of this thesis correct voting choices will be assumed to be economically and ideologically rational choices.

Furthermore, it is interesting to investigate whether voters in general try to inform themselves better, so they can make a more informed choice or whether there is a certain point after which information acquisition costs become unnecessary high. Deriving from the above definition of rationality, if the costs would exceed a threshold, where information acquisition becomes too

costly in relation to the gains, and no more information is acquired, this could potentially leave the individual without information about an ideologically suitable candidate who would better represent their interests in policy decision-making.

Another aim of the study is to investigate the rational voting choice in the multiparty context (such as the Finnish case). There is a need to choose a context in order to be able to put the issue of information acquisition in a more relatable setting and to be able to calculate the related costs. Another reason for choosing this type of a system is that it is beneficial to investigate information acquisition in a more multifaceted environment where there is more information available. In this case also more information is required for adequate decision-making, and in a multiparty setting there are different incentives to look for information, as opposed to the much studied dual-system.

To be able to quantify the information acquisition costs, a mathematical model is devised to capture measurable variables that would affect the gains and define the optimal points of voting for a certain candidate. As these costs come solely from looking for information (not voting itself, which is not considered in this thesis) they seem to contribute a large amount to the outcome of the economically beneficial voting equation, in which the individual gets the maximum amount of personal gains from their choice of candidate. Furthermore, an experiment is used to test the mathematical model and give empirical evidence on consistency of actual behaviour with the model. More specifically, the experiment aims to show when and why individuals feel a need to look for information. Additionally, thresholds of information and individual dependencies for these thresholds are investigated both in the model and in the pilot experiment.

The pilot experiment seeks to answer the research question of this thesis and find what impact information and the costs of its acquisition can have on the rational voting choice. The choice in the voting situation for participants is to select the appropriate amount of information and then vote for their preferred candidate. The participants' payoffs from voting depend on the amount of information purchased and the distance to their chosen candidate. The payoff in the experiment serves as a utility maximization measure, through which the effect of information

acquisition costs to the final utility can be measured. According to Gallego, Schofield, McAlister & Jeon (2014) the utility of the voter results from their ideological or policy distance from the candidate, as well as from other preferential considerations.

From the analysis of the experiment results it is seen that information ha a positive influence on the voting choice, whereas the costs can have a negative impact on voting if they become too big in comparison to the gains from voting. Therefore, thresholds are an important consideration with rational voting choices. These thresholds have a theoretical grounding in probabilities but are also highly dependent on the individual characteristics of the voter. Moreover, the already (freely) available information can have an impact on whether the voter decides to pay costs for acquiring more information. Although not conclusive, these results show that the impact of information acquisition and the related costs on rational voting choices need to be studied further in a multiparty system.

The thesis begins with a description of the idea and pinpoints the research questions. The next chapter reviews the existing literature and helps further characterize the topic and its relevance to previous research. The fourth chapter takes the previous research and outlines the hypothesis answering the research questions. The fifth chapter describes the assumptions made and the mathematical model used as a basis for the experiment. The sixth chapter presents the design of the experiment. The seventh chapter is devoted to the predicted outcomes of the experiment. The eight chapter describes the findings of the pilot experiment. The ninth chapter generally describes these results in relation to the hypothesis stated and suggests future developments of the research. The thesis ends with a conclusions-section which highlights the main points and results in the study. In appendices, supplementary materials on the experiment can be found.

2. Research idea and research questions

2.1.Research field

Voting is seen in the literature as either a citizen duty (Riker and Ordeshook, 1968; Ha and Lau, 2015) or as a possibility to impact governing (Downs, 1957). Dalton (2008) goes even as far as saying that citizen participation through voting is the very basis of democracy in the American context, as it constitutes a behavioural norm. Ostrom (1998) sees voting as collective action problem, as in it individuals make independent decisions for a collective outcome. As part of a democratic society, voting is also seen as a way of self- expression. Inglehart and Welzel (2005, p.151) state that the individuals become more autonomous in their information as the access to education and information increases.

From here it can be seen that voting has a key role in society as an empowering and controlling (from the side of the citizenry) function. Therefore, it can be argued that it is beneficial to investigate what motivates the individual to cast their vote for a party or a candidate. Additionally, finding out how these motivators are connected, and which are the most powerful of these motivators can help us understand not only electoral results, but also behavioural influences in voting. As already outlined in the introduction, the idea of this thesis is to investigate the initial steps of the decision-making process in a voting situation. A more detailed description of the scope can be found in the assumptions-section of the model-chapter.

The aim of this thesis is to investigate the optimality of voting choices. As this subject can be viewed from different perspectives, it is important to identify that the approach in this case is to investigate how the optimality of the voter's choice is related to the information acquisition costs incurring from the choice process. The optimality or rationality, maximizing one's gains while minimizing losses, of that choice here will be assumed to be the same as maximizing the voter's utility. This will also help in defining the costs of information acquisition as they will factor into the utility maximization equation.

As mentioned earlier, there seems to be an oversaturation in the studies of voter turnout in political research. Therefore, this thesis will not take the turnout into consideration but rather focus on the choice making process. Additionally, most of the literature is focused on two-

dimensional or two-party systems, especially the American case. To differentiate this research from the rest, the context of a multiparty system is investigated. An example of such a system would be Finland, which according to the Elections website of the Ministry of Justice (vaalit.fi, 2017) has 17 registered political parties in Finland. This presents a more varied choice setting, but also presents a demand for more information.

To be able to measure the impact information acquisition and its costs have on the voting choice, a quantitative approach is taken. The mathematical model in this thesis is built around utility maximization. The main variables influencing the cost are the individual skill of the voter (which features education and inherent abilities, among others), as well as the amount of information acquired. The main considerations of the utility function will be the state of the world, the quality of information and the overall interest in the state of the world. As can be seen, the state of the world is of crucial importance in this equation. In this thesis the state of the world will refer to the current political situation – both in terms of current governance and topical issues in policy considerations.

The interest in the state of the world speaks to the willingness to acquire information to find the ideologically best suited candidate to match the desired state, be it to keep the current one or alter it. It has been pointed out in the literature (Triossi ,2013; Ghosal and Lockwood, 2009) that it is difficult to know exactly the state of the world and therefore voters must rely on signals coming through the information they receive. Which in turn leads to the importance of the amount and quality of information one acquires. As there is no certainty of quality, both the state of the world and the quality of information should be considered in terms of probabilities. There are also many variables that are difficult to quantify but that do factor in the interest in the state of the world. Some of these are the notions of ideology, partisanship and normative behaviour. The model and the variables in it will be discussed in more detail in the Model-chapter of this thesis.

2.2.Research questions

In order to gain a better understanding of the scope of the thesis and of the aims, it is important to identify the research questions this thesis seeks to answer. They are as follows:

Research question:

How do information acquisition and the related costs influence rational voting choices in a multiparty setting?

Sub questions to the research question:

1) *How influential are the information acquisition costs to the utility from the voting choice?*
2) *What amount of information is "enough" in order to maximize one's utility? Is there a difference in thresholds?*
3) *Does readily available information influence the willingness to acquire more information?*

The next chapters aim to answer the posed research questions and test the stated hypothesis through a mathematical model and a pilot experiment. However, first, an overview of the related literature is given to back the hypothesis and further define the research area.

3. Literature review

This chapter gives a review of the previous literature on the topic of voting behaviour and the information acquisition related to it. To more fully clarify the theory behind the thesis idea, first an overview of voting research is given. As it is important to define the terms and concepts used, a more detailed review on the existing findings on voting behaviour, correct voting and all the elements related to voting behaviour are considered in detail.

3.1.Voting research

As already stated, the interest in voting behaviour has been extensive and can be traced back to the 1950s. One of the first, and most influential names in voting behaviour research is Anthony Downs. In his paper "An Economic Theory of Political Action in a Democracy", Downs (1957) looks at democracies and role of governments. A large part of the publication is devoted to the voter and the amount of information he possesses. It is stated (p.138) that the presumption for a rational actor is to vote in such a way that a government, which is most beneficial to them in terms of policies, is elected. (Downs, 1957.) This outlines the same interest that Lipset had in 1959 – the rationality of the voter and their choice of a representing candidate or party. Since then there has been a lot of attention given to both rationality and correctness of the vote. This area of research is discussed in more detail in the next section.

As stated, most of the research on voting behaviour has been done in the American on British context. However, there is some research done in the European context and in a multiparty system (e.g., Rivero, 2015; Boudreau, Elmendorf and MacKenzie, 2015). It has been shown that the number of parties does matter in voting choices. For example, Gallego (2010) states that there is evidence in research that political party number is correlated with the amount of information people possess – for the more informed larger numbers of candidates and political parties are a positive attribute, whereas for the not so informed they are a negative attribute. Therefore, studying information acquisition in a multiparty system is bound to present different, and perhaps more insightful findings than the literature on two-party systems has so far.

There is also evidence from the Finnish case in voting behaviour. Westinen (2015) in his article on cleavages in Finnish political participation found that social cleavages are indeed connected to party choices and the value-attitude dimension of choice making. Additionally, Wass and von Schoultz (2015) found that voter preferences for party representation in the government increases with age and education. Furthermore, Lahtinen, Wass and Hiilamo's (2016) argue that the free and equal education in Finland provides a good starting point for social mobility and thus more mobility in voting patterns (Lahtinen et al., 2016). However, there is no notable research in the field of voting decision-making.

3.2.Voting correctly

As mentioned rational choice and correct voting have received a lot of attention in the voting literature. But what is rationality and rational choice? Downs (1957, p.146) presents the following economic axiom:

"It is always rational to perform any act if its marginal return is larger than its marginal cost".

Bendor (2011) states that rational choice theory has contributed a lot to the understanding of political behaviour. Additionally, Larcinese (2007) points out that many times voting behaviour is explained through the tools of rational choice theory. However, he argues that there is a problem with this view because what is rational to an actor largely depends on that actor's perceptions of what reality is and not so much of what the optimal solution would be. (Larcinese, 2007, p.249-250.)

Rationality can indeed be difficult to define and measure in individual decisions. Lau and Redlawsk (1997) begin their paper by pointing out that there is only a minority of people who can literally be rational voters by keeping themselves informed and therefore making rational voting choices. Martinelli (2007) supports this claim that being informed is not universal. However, he does point out that generally the utility of the informed voter will be much higher than the utility of the uninformed one (Martinelli, 2007). Therefore, Martinelli (2007, p. 315) proposes a revised, "weaker" version of the rational ignorance hypothesis by stating that because the costs to stay informed are so high, an individual voter would prefer to stay uninformed in larger elections where their contribution is not notable.

As the nature of rational behaviour is disputable another term is frequent in the literature - “correct voting”. It was developed by Lau and Redlawsk, who (1997) define a correct vote as one which is made with individual considerations of beliefs and values in mind, and not with globally beneficial considerations as a prioroty. The authors also point out that in order for a vote to be correct it should be made as if the voter had all the information needed to make a fully informed rational choice (Lau and Redlawsk, 1997). Since then the literature on voting behaviour has primarily used this term. For example, Joesten and Stone (2014, p.747) use the term ““correct” voting” to define the vote which goes to the ideologically most proximate candidate. This will also be how the term will be used in this thesis – the correctness of the vote will be measured by the ideological distancing between the voter and the candidate on an ideological line.

Furthermore, Tyszler and Shram (2016) state that the assumption behind correct voting is taking the aggregated results from individual’s best-chosen candidate, who matches ideologically the closest to the individual. However, the authors recognize that there is a problem with such voting, as often individuals engage in strategic voting which in turn means they do not necessarily vote for the most preferred option but for an option that with highest probability would result in a best outcome. In a sense the authors make a distinction between an optimal outcome and optimal individual preference. (Tyszler and Schram (2016).) This is an important point to make, and a further justification for not using strategic considerations in this thesis. In a related fashion, Riker and Ordeshook (1968) state that there are many who claim that voting altogether is irrational. However, they show that this opinion occurs because utility from voting would be looked at only as a contribution to a common good and not consider variables unrelated to contribution that might be of intrinsic value to the individual, like duty (Riker and Ordeshook, 1968).

So, what does drive the individual to vote – personal interest or a greater good? The high stakes voting literature (Andersen, Fiva & Natvik, 2014; Gershkov and Szentes, 2009; Bognar, Börgers & Meyer-ter-Vehn, 2015) concludes that an individual is more likely to vote or take interest in elections if they feel their vote matters or can be of importance for the outcome. According to Andersen, Fiva and Natvik (2014) rational choice theory assumes that individuals vote because they can have an influence on the results of the election. They also point out that

an individual only votes if their benefit exceed their costs (Andersen et al. (2010). Although their research concentrates on voting turnout, this can be applied to the more general idea of voting behaviour – the individual will try to vote in a way that maximizes their outcome.

3.3.Information acquisition and cognition in voting

As can be seen from the already mentioned research, the vote and the related utility is often associated with information. As Gallego (2010) points out people who are more informed tend to turn out and to vote in a way that is profitable for themselves. Supporting this claim, Larcinese (2007, p.250) argues that by viewing voting as an instrumental action and considering rationality, closeness with regard to vote differences in outcomes should incentivise voters to seek out information as their vote is perceived as more valuable.

Even though Tyzsler and Scram (2016) used information to study strategic voting, they too bring out the importance of information in decision-making. In addition, Ryan (2010) states that it is usually perceived that an informed vote is a more accurate one. All of this evidence suggests that information is important for forming the voting choice. But what amount of information is enough to vote correctly?

Grosser and Seebauer (2016) look at voting correctly in a group and state that whenever the vote is informed and sincere by all voters, then the outcome becomes correct. Furthermore, Downs (1957) states that information does not only come from the electoral campaigns of a given party, but also from the current performance of the party in the government. This comes to show that there is a lot of information available and in theory one could become fully informed and make a reasonable, and advantageous to themselves and to society, decision about which candidate to select.

However, this abundance of information does have its drawbacks. Lau and Redlawsk (1997) show in their study and experiments, that there is so much information on candidates that individuals could relate all the pieces of information they have in numerous different ways to the candidates and themselves and thus reach a varied number of “best” outcomes. In addition,

Lupia (1992) points out that there are information asymmetries between voters, as the information quality and degree differ between individuals, which in turn might lead to false expression of preferences. The author also states that there is a principal-agent problem in voting, as the agenda setters - the parties and candidates - have complete information about policies and the current state of the world, whereas the deciding party – the voters – have incomplete information (Lupia, 1992). Downs (1957) points out that for these reasons there is a need for expertise-agents to fill the gaps of imperfect information. Lupia (2016) calls these competent informants educators, as they bring the needed relevant information to the voter. Ryan (2010) argues, following Downs' (1957) concept of political informants, that to make information acquisition costs lower individuals tend to select their sources according to certain criterion. These include a certain value-bound agreeableness in ideologies, as well as a perceived agent-expertise (Ryan, 2010). However, it could be argued that these agents only further deepen the principal-agent problem, as there is not only a discrepancy of incentives between the voter and the elected official, but now there is an expert, speaking on behalf of one of these agents and driven by their own motives.

Downs (1957) states there is another reason for imperfect information to be common among voters - knowing everything is highly costly. As comparing information about parties is costly, individuals turn to the party's ideological standpoint which summarizes the views of the party (Downs, 1957, p.141). Additionally, Oliveros (2012) stresses in his paper that the amount of the information acquired always depends on the utility losses, especially as the ratios are considered. This brings us back to the rationality discussion and the proportions between the gains and losses in the voting situation.

In addition, Bognar, Börgers & Meyer-ter-Vehn (2015) state in their paper that information acquisition cannot be without cost, especially if the information has positive externalities for the individual that lie outside of their personal interest. In the same line of thought, Gershkov and Szentes (2009) state in their study that as it can be very costly, and at times inefficient, to acquire all the information needed. Therefore, optimal mechanisms for information acquisition that might not necessarily bear the highest quality of results or knowledge are applied to reduce the information gap (Gershkov and Szentes, 2009). Although these two papers study voting in a situation where information is shared between participants, these kinds of cost reducing

mechanisms can be applied in a more personal context. For example, Lau, Andersen and Redlawsk (2008) state that the individual does not have the cognitive capacity to stay fully informed and hold their elected officials responsible to fulfilling their promises from election campaigns. They conclude that it is for this reason that intuitive voting comes in (Lau, Andersen and Redlawsk, 2008).

However, there are other factors beside the amount of information that matter. Ghosal and Lockwood (2009) state in their paper that not only the amount of information, but also the type of information that an individual has will influence their vote. They also state that when the individual considers the information they have when formulating their vote decision, they improve the collective outcome of the vote. The authors also found that when the bias in the electorate is low, individuals tend to acquire information and base their decisions on that information. (Ghosal and Lockwood (2009).) Additionally, Oliveros' (2012) paper concludes that individual voters collect different quality of information in equilibrium, depending on their intensity of ideology and the precision selected for the signal received.

To further this claim, Joesten and Stone (2014) investigate spatial voting and argue that an individual cannot possess all the required information to be able to surely say which candidate is at the ideal ideological distance to them. Ideological distances are discussed in more detail in the next section of this chapter. Joesten and Stone (2014) also found that even if the voter does not have all the information he/she does seem to vote in a way that resembles proximity voting. The authors argue that information might not be as necessary as thought and that similar patterns of decision-making may occur due to other factors, such as social networks or beliefs (Joesten and Stone, 2014).

Moreover, if we take the individual abilities and interest into account, there are different drivers for voting and information acquisition. Verba, Nie and Kim (1987) studied the role of institutional affiliation in political activity by comparing data from different countries and found that in the case of voting the individual social resources and interest were of most importance. Furthermore, Lau et al. (2008) state that drawing on correct voting there are two main motivators for decision-making – to make a good and easy decision. They add that the

effort exerted would depend on the stakes of the decision and on the individual's inherent cognitive abilities (Lau et al., 2008).

Kahneman (2003) terms the ease of association in cognitive tasks as "accessibility". This accessibility is stated to be a continuum in which by repetition and association tasks become less effortless and more relatable. Kahneman (2003) states that the notion of good and bad is almost automatic as is carried out by natural assessment. Moreover, ambiguity is stated to be suppressed by perception. The accessibility in Kahneman's (2003) paper shows that rationality may not always be the answer, as some more intuitive decisions can be made due to higher accessibility. (Kahneman, 2013.)

Downs (1957) repeatedly reminds us that there is no perfect information, as the amount of information needed to make a perfectly informed decision is impossible to obtain, and mostly – there is no perfect decision. He also states (Downs, 1957, p.147): "it is irrational for most citizens to acquire political information for purposes of voting." In the end, as Degan and Li (2015) point out, there is no right answer for how people vote – their behaviour could depend on various reasons from personal benefit and expression, to aspiration to act as the rest of the population, or even regret.

3.4.Ideological, partisan and personality-related concerns in voting

To better understand voting behaviour, it is useful to look at what the main personal determinants for voting choices are. Krosnick (1988) states that voters often search for parties and candidates who have the same ideologies and attitudes in terms of policies. However, Converse (1964, in Converse, 2006) points out that ideology is not a simple thing to define.

It is frequently mentioned in the literature that information acquisition and ideology are related. Oliveros (2012) states in his paper that ideology and information acquisition are strongly linked – new information can act as bias strengthening to the voter who is not ideologically bound, whereas the highly ideological voter rarely searches for new information. For example, Boudreau, Elmendorf and MacKenzie (2015) found in their study on local US elections that in

elections with less information on the candidates, individuals tend to be more interested in the ideological distancing between themselves and a candidate. Additionally, the authors conclude that certain information cues about partisanship or other non-policy related information makes the ideological distancing less influential in decision-making (Boudreau et al., 2015).

However, in other studies it has been seen that ideology might be of the most importance to the voter. Brown's (1970) investigation into the differences between the ideological standpoints of the elitist doctrine and the populist one bore interesting results. By comparing groups with strong or little to no interest in politics and their choice of placement of political statements on an importance scale over time, he was able to reach conclusions about the centrality of participants and the consistency of their beliefs. Brown (1970) found that for both treatment groups the ideology seemed to be persistent over time, even though otherwise there seemed to be no significant differences between the two groups. (Brown, 1970.)

Furthermore, Larcinese (2009) points out that partisanship and ideology have been shown to be one of the strongest determining factors of voting choice formation. He states that the willingness to acquire information is related firstly to the existence of prior beliefs and opinions about parties and candidates, and secondly to the possibilities that the new information will change prior beliefs and evaluations (Larcinese, 2009, p. 4). Larcinese (2009) states that according to a study on British voter's choices, individuals on "the intermediate levels of ideological strength" (p.5) are the most likely to have incentives to seek for additional information about candidates and parties. Similarly, Jessee (2010, p.328) states that usually when there is less information available, individuals do not seem to be influenced by ideological distancing, whereas with a higher level of information the policy stances of candidates improve in importance. He also sees that partisanship plays a role in the willingness to acquire information and depends on that information as determining in the choice-making process (Jessee, 2010). From this it can be concluded that ideology seems to be more important than partisanship in determining the final voting choice.

Another example of similar findings is the one by Boudreau, Elmendorf and MacKenzie (2015). They state that ideological positions are not always related to partisanship. In their

study of local elections where voters did not necessarily have information on the political affiliation of the candidate, it seemed that the criteria for choosing a candidate was their policy and other ideological positions. (Boudreau et al., 2015.) However, Ansolabehere and Puy (2017) state that usually in elections there are multiple issues and policies that are of interest to the voter, and there is a problem in ranking those in accordance to importance to the voter.

It would seem that there is something missing in the considerations of choice-making. All of the information required for a rational choice cannot be obtained, and partisanship or ideological standpoints do not always entirely define the voter's choice. Therefore, the individual aspect of the voter's decision-making process has to be taken into account. In a broader sense, it has been shown that the person's psychology and especially personality have an effect on how they vote, especially in terms of ideology and interest in politics (Ha & Lau, 2015). They point out (p.976) that usually the measured personality characteristics of the voter related to political behaviour are: political ideology, interest, efficacy, discussion and participation, as well as civic duty. Additionally, it is brought up that personal traits have been shown to have influence on party identification. Ha and Lau (2015, p.987) found in their research, that personality traits in themselves do not have statistical significance in determining whether or not the individual votes correctly. However, in a second model, personality traits when controlled for with variables associated with correct voting, do seem to be significant at the 95% level. (Ha and Lau, 2015.)

Some other research such as the one by Hillygus (2005) has found that higher education increases some of the abovementioned traits as it provides the understanding of how politics work, thus lowering the effort of participation, and provides the network in which to discuss political questions. Lipset (1957) also stressed the role of education in understanding political processes and a fuller participation in a democratic society.

However, it does not only depend only on the personal dimension when we choose whom to vote for. Coleman (1988) states that in voting choices we often take into account norms, as well as the preferences of our ingroup members. This notion of there being a strong normative influence on voting choices will not be investigated in detail in this thesis. Nevertheless, it is

important to point out that there might be other strong influential variables than the ideological considerations of the individual.

To sum up, decision-making in voting is not a straightforward process. There are individual traits that affect behaviour and that give different weights to either policy and ideology related considerations, or to other personal conserns. However, there seems to be a consensus that information on candidates' and parties' ideological standing, the state of the world and the active participation in democracy-enhancing activities improves the individual's and society's gains and payoffs.

4. Hypotheses

Drawing on the abovementioned literature, the following hypothesis relating to the research questions have been outlined:

Hypothesis:

> *The information acquisition costs will have a negative impact on the utility of the voter. However, information acquisition in itself will increase the gains of voting.*

The negative impact notion is presented because the information acquisition costs are deducted from the overall gain of voting. However, the acquired information itself and the amount of it can have a significant impact on the maximizing of the vote utility, as the voter requires information on the state of the world and on candidate or party positions.

Sub hypothesis:

1) *The information acquisition costs are highly influential to the utility of voting.*

The correct positioning of the candidates in relation to the voter and decision-making in accordance to one's most valuable preference makes information acquisition, and especially the deducted costs related to it, crucial to the voting choice. Not only are the costs influenced by the amount of information acquired, but also the accuracy of information and the truthfulness of other variables depend on the information gathered.

2) *The amount of information "enough" to make a voting choice will be the one maximizing one's personal utility. The threshold of information gathered will vary across individuals.*

As stated in the literature review, the notion of "enough" information can vary significantly between individuals due to different priorities in decision-making processes. Some voters will have stronger ideological and policy-related preferences, whereas some will feel that

partisanship and normative considerations are of most importance when voting. Moreover, there are inherent skill-related considerations which affect the amount of information the voter is willing to obtain. Therefore, individuals will have different incentives and thresholds related to the amount of information acquired.

In more economic terms, the costs should be always less than, and proportionate to, the gain from voting in order to maximize the utility from voting. The difference in thresholds for information acquisition amounts will be dependent on the individual utility, and individual considerations of the voter.

3) *Readily available information does have an influence on information acquisition.*

It is more realistic to assume that the voter has some sort of readily available signal about either the state of the world or the ideological stance of at least one the parties or candidates running for election. This initial information will have a defining impact on the willingness to acquire information. If this information satisfies the choice criteria for the voter, he/she will most likely not be willing to invest in acquiring any additional information. However, if the signal is of negative value to the voter, as giving information on a candidate the voter does not intend to vote for, he/she will feel the need to find a better suited candidate through investing in more information. As in the previous sub-hypothesis, also in the case of initially available information the willingness to seek for information will rely on the voter's priorities in decision-making, as well as on personal ability.

To sum up, information acquisition and the related costs are very influential to the outcome of the voting choice. Information acquisition itself can be a utility enhancing feature, whereas the information acquisition costs can have a negative impact on the voting utility. The strength of influence of information acquisition is dependent on the personal ability, interest and priorities of choice-making in a voting setting. The next section gives a more insightful answer to these influences through mathematical modelling. Empirical evidence on the influence of information acquisition costs can be found in the results of the pilot experiment.

5. Theoretical model

For the purposes of quantifying the elements of voting behaviour and being able to answer the posed research question of how information acquisition costs influence the voting choice, and especially to show the magnitude and importance of acquiring information, as well as to relate those costs to the other important and influential variables, it is seen as necessary to construct a mathematical model.

Previous research on the matter of voting behaviour (e.g., Larcinese, 2006; Triossi, 2013; Ghosal and Lockwood, 2009; Dassonneville, Hooghe and Miller, 2017; Singh and Roy, 2018) presents mathematical models – some of which very detailed and complex. Many (e.g., Triossi (2013), Tyszler and Schram (2016)) have elements of strategic behaviour, while others (e.g., Larcinese (2006), Ghosal and Lockwood (2009)) consider the costs of voting on election day. As the purpose of this thesis is to look at the very initial stages of voting choice-making, assumptions are firstly made to define the area of consideration. Next the model applied is described. The model chosen as best suited for the purposes of this thesis is derived from previous literature and has been expanded to better serve the multiparty context.

5.1.Assumptions

A couple of assumptions must be made at the beginning in order to justify the chosen model in relation to the main research question about the influence of information acquisition and the related costs on the voting choice. These assumptions are made to better define the scope of the decision-making process at hand, as well as to state which considerations will be removed to simplify and specify the model.

For instance, some of the features of voting analysis can be eliminated to simplify the model built. One of these features is the notion of being pivotal – having a decisive influence on the outcome of the election (e.g., Larcinese, 2006; Triossi, 2013; Ghosal and Lockwood, 2009). As there are many parties as well as and some independents involved in all elections in a multiparty system, it is nearly impossible to know when one's vote would be of major importance. It is true that prior to making the voting choice one could obtain information on the general popularity of parties and the probabilities of a candidate being elected. This

information is in most cases quite accurate and can prompt the voter to behave strategically. However, this thesis does not consider strategical voting, as that is another large question which in the multiparty system would require extensive modelling. Therefore, it will be assumed that there is no effect on the voter's utility that would arise from being pivotal.

Another feature of voting choice-making which is frequent in the literature (e.g. Triossi (2013)) is coalition formation. When coalition formation is considered as a part of voting decision-making, strategies are assumed to involve a consideration of which parties would be likely to go into coalition together and form a government. The purpose in this thesis is not to look at strategies, so this consideration will not be considered here either. Even though it would not be impossible to speculate coalition formation between parties, the candidate should have some knowledge on the possible vote distribution and the parties which will be willing to go into coalition together. As this consideration is complex and rather uncertain, and would require specific knowledge on the matter, the assumption in this thesis will be that the voter does not take into account coalition possibilities when choosing their preferred candidate.

This study is framed as a voting setting. Due to the previously mentioned assumptions some additional clarifications have to be made. The first of these is the assumption that the act of physically casting a vote is costless. The literature that discusses turnout (e.g. Larcinese, 2006; Ghosal and Lockwood, 2009) states that the action of voting can be costly to the individual and can have an impact on the overall cost in the utility of the voter. However, the aim of the thesis is to look at the very initial stages of forming the voting presumptions and choices. Therefore, it was not seen as necessary to include these voting costs. In addition, it would have been difficult to estimate the exact costs for individuals as there is no real voting that would require a specific added effort taking place.

As previously mentioned, voting is seen as either a compulsory duty or a voluntary right. The purpose of this thesis is to see how individuals vote. Therefore, it was seen as necessary for the experiment to simulate a compulsory voting situation. It was not explicitly stated that voting is compulsory, but the option of not voting was not explicitly given either. To be able to calculate one's payoffs, it was required of the participant to know the ideological distance between them

and their chosen candidate. The literature on compulsory voting seems to differ for the real-life situations and when it comes to laboratory experiments. Dassonneville, Hooghe and Miller (2017) found in their paper that compulsory voting decreases voting based on information and ideological distances. Similarly, Singh and Roy (2018) found in their research that compulsory voting decreases the individual's incentives to look for information on candidates. However, in laboratory experiments the compulsory vote is frequently used. An example of such a situation is Tyszler and Schram's (2016) experiment on strategic voting. Moreover, Grosser and Seebauer (2016) state in their paper that when voting is voluntary, usually uninformed voters tend to abstain from voting. Additionally, in their experiment the authors find evidence of compulsory voting increasing the amount of information acquired (Grosser and Seebauer, 2016).

A further assumption in the model is that the candidate's ideology is one with the party's which he/she represents. In real life a party consists of many candidates who in multiparty and especially in open-list proportional voting systems (a voting system in which the voter can influence the ranking of candidates inside the party) try to differentiate themselves through different policy considerations. However, for the purposes of clarifying calculations in this model it is assumed that all candidates have the exact same values as their own party. Therefore, considerations about different candidates can be put aside and in this thesis a candidate and a party are seen as the same instance.

The issue of partisanship will not be directly discussed in this thesis. However, the effects of strong partisan affiliation can be translated into a weight variable which expresses the overall interest in the state of the world. As is stated in the literature (e.g. Larcinese, 2009), the strongly partisan voters do not usually acquire information on the state of the world as they feel they must vote for their own party, regardless of their policy standing and how that standing relates to their own.

Finally, it is common to assume that there is a learning curve associated with the increase in acquisition of information that would reduce the cost of information after a certain period of time. In the cost function in the model the skills of the voter and the amount of information are

presumed to be linear as the skill does not increase in the process but is rather a readily available measure at the starting point to predict the optimal amount. If a learning curve were to be added, it would have to be adjusted accordingly to the personal learning abilities. As these abilities are not easily quantifiable, there is a large margin for error. Therefore, the assumption here is that the inherent and acquired skills up to the point of facing the voting decision are what determines the optimality of the amount of information and the gains from utility maximization.

5.2.The model

The model for this thesis was mainly derived from Triossi's (2013) equations on the costs of voting choices. The overall utility equation is the same as in Triossi (2013), and the general flow of equations follows his logic. However, the rest is modified to better match a multiparty setting. Moreover, some considerations in the original article have been omitted as they were found to be irrelevant for this thesis. The weight of whether or not a voter is interested in the state of the world was chosen from Ghosal and Lockwood's paper (2009) as it enables the differentiation between the interested and not so interested in ideological and policy considerations voter and the differences in incentives thereof they might have to acquire information.

Attention in this thesis is focused on the utility function of the individual voter. More precisely – this utility concerns a very initial decision-making stage which is related to the overall interest in politics and voting as well as the ideological distances between the voter and the candidate. The full voting utility (denoted as *E(U)*) is expressed as the utility resulting from selecting the better candidate (denoted $U(v_A)$), or the gains of voting correctly, minus the cost (C) of making that voting choice and can be expressed as follows:

$$E(U) = U(v_A) - C(\alpha, z)$$

For clarity the preferred candidate of the voter will be A and the preferred policy, or state of the world, correspondingly – a. The cost in this equation is seen as a function of the inherent abilities of the voter α and the amount of information retrieved z. The cost function is expanded later on in this chapter.

The general assumption with this choice is that:

$$U(v_A) > U(v_I),$$

or that the utility from choosing the preferred candidate A is bigger than the utility from choosing any other candidate. To further clarify, the utility from making the individually rational choice $U(v_A)$ can be expressed as follows:

$$U(v_A) = \lambda q_a p_a \sqrt{(x - x_a)^2 + (y - y_a)^2}$$

In this equation λ stands for Ghosal and Lockwood's (2009) weight variable, which expresses the voter's interest in the state of the world. The state of the world here is differentiated from a private preference where the variable can take the value of 0, if only personal considerations matter, or 1, if the state of the world is of importance to the voter. This weight assignment is opposite to the one in the article by Ghosal and Lockwood (2009). Their purpose and the purpose in this thesis differ and that is why it was necessary to change these values. In this thesis the aim is to look at an ideologically informed "correct" choice. The variables in the abovementioned model are all connected to information and the state of the world. Therefore, an interest in the state of the world would enhance these variables, whereas a disinterest in the state of the world would drive this utility close to 0 and show that there are other factors governing the individual's decision, which are not captured by this model.

Additionally, this measure of interest in the state of the world represents valence in the voting choice. Jessee (2010, p. 328) states that valence accounts for attributes that are seen as equally valuable as policy or ideology by the electorate, such as charisma and intelligence. Gallego, Schofield, McAlister & Jeon (2014) describe valence as other, non-policy related characteristics of the candidate which appeal to the voter.

The variable q_a in the voting utility equation expresses the probability that the state of the world is indeed a (which would correspond to the chosen candidate A). And the variable p_a stands for the probability that the information received on the state of the world a is accurate. This variable is tightly linked to information. When there is interest in the state of the world – be it policies or values - there is a need to acquire information on it. However, that information might be accurate, or such as in the case of fake news, might be misleading. In a multiparty

system these probabilities and their truthfulness require a lot of investigation. As Downs (1957) states the effort to keep oneself informed about the dealings of individual parties in a multiple party case can be tasking.

Overall these two variables are tightly linked but are not equal, as there might be limited access to information or the outlets one searches in might be biased in one direction or the other. It could be stated that in a democracy without censorship these two come close to being equal but in a censored environment there might not even be the opportunity to access correct information on the state of the world.

As already mentioned, the variable p_a expresses the probability that the information received about the state of the world is correct. To calculate this likelihood the following equation must be solved:

$$p_a = \frac{1}{N} + z$$

Or, the probability of the information on the state of the world being correct equals the sum of the amount of information received (z) and the probability of the signal of the state of the world being a. In the fraction $\frac{1}{N}$, N is the number of signals about the state of the world.

The $\sqrt{(x - x_a)^2 + (y - y_a)^2}$ part of the equation expresses the ideological distance between the point of a candidate and the voter's point in the Nolan chart space as measured by Eucledian distancing. The Nolan Chart was published by David Nolan in the 70s and depicts two axes which represent personal and economic freedom values (Silver, 2010). Given this chart and the formula for Eucledian distances, it is clear that the *x* variable measures the distance on the x-axis, whereas the *y* variable measures the distance on the y-axis. This kind of ideological distancing and calculations have been used in the literature (e.g., Jessee, 2010; Joesten and Stone, 2014).

As already mentioned, the cost of the voter, $C(\alpha, z)$, is expressed as a linear function of the voter's inherent skill and the amount of information acquired. As Triossi (2013) states, if the

skill of the voter – which includes their education, cognitive abilities - is higher they will acquire more information.

From this cost function ($C(\alpha, z)$) and the expected utility formula it can be derived that the optimal point of amount of information (z), which is also the marginal cost for acquiring information, is as follows:

$$C_z(\alpha, z) = \sum_{i=a}^{z} \lambda p_i q_i \sqrt{(x - x_i)^2 + (y - y_i)^2}$$

Or the cost for the optimal amount of information is equal to the sum of utilities for voting for each candidate. The sum here of all the expected gains for a certain state is also the marginal gain of acquiring information. (Triossi, 2013.)

This is the detailed form of the equation for looking at how information influences the outcome of the voting choices. From the breakdown of the equation it can be seen that information does indeed have a negative impact on the vote choice as stated in the main hypothesis of this thesis. Firstly, the costs for voting come solely from acquiring information, which means that the only deducted part in the utility function arises from information acquisition. Secondly, the information is essential in the candidate/party choice, as many of the variables are based on information, such as the current and possible states of the world, as well as the ideological distancing between the voter and the candidate. Therefore, sub hypothesis 1 is seen as true – the costs can have a big influence on the utility of voting if they are high enough to change significantly the gains from voting for the chosen candidate.

Furthermore, the weight variable λ, which captures individual interest is notable when considering sub hypothesis 2, as it shows there can be different incentives for information. The optimal cost function best shows that the threshold for acquiring information is dependent on all variables that contribute to the utility of the voter and therefore it can be concluded that there are thresholds to information, but they vary with individual considerations. The main considerations in the voting situation are interest in policy versus interest in other non-policy

and ideology related matters, validity and amount of acquired information, as well as the voter's inherent ability.

In the next chapter this model is simplified and adapted to match the purposes of a lab experiment.

6. Experiment design

The experiment was devised using previous literature on voting behaviour and ideological distancing (Lupia, 1992; Rivero, 2015; Boudreau, Elmendorf and MacKenzie, 2015, Jessee, 2010; Ansolabehere and Puy, 2017). Generally, laboratory experiments are currently a desired method of testing out theoretical models. As Levitt and List (2007) state, laboratory settings provide a unique opportunity to test behavioural effects, as in the lab all other things are held equal, there is no interference from other factors which could occur in a daily setting. For example, Tyszler and Scram (2016) used a laboratory setting to study strategic voting behaviour. Additionally, Grosser and Seebauer (2016) ran a laboratory experiment using game theoretical concepts to investigate information acquisition and incentives to vote. In their experiment information acquisition is seen as the first stage and voting itself as the second stage of decision-making (Grosser and Seebauer, 2016).

There are prominent examples of the use of ideological distancing in voting choices. Downs argues (1957) that in a multiparty system the parties are even more incentivised to have a specific ideological standpoint and remain in that position in order to attract more voters. In his example all parties are distributed alongside a one-dimensional axis and occupy a defined point on it. As the voters are distributed alongside the ideological line, if a party were to move to one direction or the other, it would lose a portion of votes from the other side of the axis. (Downs, 1957, p.143-144.) Additionally, Jessee (2010, p.327) states that the assumption of a spatial model in voting research is that a candidate and a voter have an ideological point in space and the voter chooses a candidate based on the distance between these two points. Moreover, Lupia (2016) states in Chapter 5 of his book that experimental work is a very good tool for measuring the importance of information in voting decisions.

The starting point for the experiment came from the previously discussed mathematical model and was adjusted and simplified in order to be able to test the very basic reasons behind information acquisition. Also, with considerations to ease the task of the participant, the ideological distribution is presented on a single axis as in Downs' (1957) example and not on a Nolan chart as it usually is in real life in multiparty systems.

6.1. Ethical considerations

With the experiment design it was made sure no ethical considerations were overlooked. The participants in the experiment attended the same course in Comparative Education Policy. They were told a couple of weeks in advance by their teacher that there was going to be an experiment held as a part of a class session. Permission to conduct an in-class experiment was granted by Tuomo Kuivalainen, the teacher responsible for the course. Participation was voluntary, and the subjects were unknown to the experimenter and the assistant. When informed about the experiment they were also told they would receive an actual payoff from it. However, as the experiment was not funded, only one round's payoffs were distributed in cash and chocolates.

In the beginning of the instructions the purposes of the experiment were stated (please refer to Appendix 1). Throughout the experiment the participants' anonymity was ensured by assigned ID numbers. The round for which the payoffs were given out, as well as the ID of the person to receive their payoffs in cash was selected by an online Random Number Generator, the operations in which were displayed on a screen, so everyone could follow the procedure.

6.2. Experiment assumptions

The experiment for this thesis aims to examine the abovementioned model with regard especially to the ideological distance choices. In order to simplify the experiment and make it more accessible to the participant in a pen and paper version, a couple of modifications to the formula had to be made.

Firstly, the candidate or party positions are not displayed along a two-dimensional axis but are presented on one axis. This was done so that the participants would not have to perform complex calculations and the experiment itself would be more easily approachable to the participant. Ideally the two-axis display would present more of a challenge which would even further bring out the importance of the inherent skill of the voter, but for a small-scale experiment this is not seen as necessary.

Secondly, participants will not be self-reporting on their interests towards the state of the world. Self-report may not always be accurate. In addition, as there are no concrete issues or states of the world presented it would not be relatable enough to give a concrete answer to. Instead, the interest in the state of the world could be deduced from the willingness to acquire information – if a participant does not look for additional information concerning the position of other candidates it could be deduced that they were not too concerned about the state of the world. For it to be possible to reach such conclusions, the distances are set as equal or approximately equal in the experiment. More detailed description of this positioning can be found below.

Thirdly, the probability of the information about the state of the world being correct is assumed. As all the information given will be the only information it will by default be true, there will be no fake or misleading news involved. However, the amount of information retrieved is the one that will more clearly speak to the probability of the voter knowing the true state of the world. If the voter acquires all the information, he/she will know that their knowledge about the position of their preferred candidate is the closest to them with a probability of 100%.

Fourthly, the cost of acquiring information is set to be relatively high. In reality costs for acquiring information may differ. As in the experiment the task of acquiring information is simple and straightforward, it is seen as necessary to make the cost higher. The cost in the experiment for a piece of information is 1€, which is approximately 11% of the maximum 9€ payoff. This amount is also chosen because it is easily computable in the payoff formula.

Finally, the distribution of the parties along the ideological axis is not revealed. Although in real life one would be easily able to acquire information on all the parties position and relate them to each other, it is seen that by knowing the distribution one might engage in strategic considerations. As previously stated, strategy is not a part of this thesis. Moreover, there are interesting behavioural effects arising from uncertainty. These are discussed in more detail in section 7.4. of the next chapter.

6.3. Pre-pilot experiment

The pre-pilot experiment was conducted so that the experiment design could be tested and improved for the pilot experiment. The participants in this round of experiments were former and current students in the Public Choice Programme at the University of Tampere. There were altogether 7 participants in this test experiment. The pre-pilot consisted of 3 rounds of voting, filling out a survey and distribution of payoffs from a randomly chosen round.

The voting round started off with distribution of ideological axis information about the voter and one candidate. The three rounds were differentiated by giving varied positions for the participant and candidate positions. The participant's position was on the far left on the first round, on the far right on the second round, and centred in the third round. The candidate position distances were also different, being 8, 4 and 7 for the respective rounds. The letter of the candidate initially displayed was kept the same – in each round the participant would know where candidate "C" stands. This was done so that the participant would suspect that the positions in each round are different.

The additional information was also varied in each round. It was presented on separate slips of paper the voter could freely choose from. The papers were placed upside down in a randomized order, so the participant could select whichever slip of information. The amount of selected information could be controlled for in the payoff calculation, which also included their distance to the selected candidate. After the three rounds were conducted and the surveys were filled, the third round was randomly selected as the paid round and the payoffs were given out in chocolate candies to each participant.

The participants were asked to give feedback on the experiment in writing and make suggestions on improving the experiment in a discussion-session. It was concluded that additional rounds should be added to better capture the decision to seek information. In addition, some of the questions in the survey were specified and a question about the strategy and choice motivations was added.

From the results of the experiment and the feedback it was concluded that there needs to be a practise round to make sure everyone understands how to select their candidate and calculate their payoffs. Additionally, to make matters simpler for the payoff receiving at the end of the experiment, it was seen as beneficial to add a slip of paper which would contain the person's earnings for each round, as the voting sheets were collected after the completion of each round. The results of the pre-pilot will not be discussed further, as the purpose of this stage was to enhance the experiment design for the pilot experiment.

6.4. Pilot experiment

The actual pilot experiment which investigated how the information acquisition costs influence the utility maximizing vote was conducted in a classroom with students enrolled in the Comparative Education Policy course, a part of North American studies. The time of the experiment was Monday 05.03.2018 in the afternoon between 14:15 and 15:00. There were altogether 9 participants in the experiment.

The experiment began with reading of the instructions by the experimenter, which stated the purposes and nature of the experiment. (For the instructions, please refer to Appendix 1.) In the instructions the participants were informed they would receive their payoffs for a randomly selected round of the game and that one of the participants would receive their earnings in cash, whereas the rest would receive their payoff amount in chocolate candy.

The next step was to do a practise round to make sure everyone knew what to do in the actual rounds. The participants were given an ideological line displaying their position and the position of all 6 candidates (the practise round can be found on the second page of Appendix 1). The participants were asked to select their chosen candidate and calculate their payoff for the round. The researcher and assistant made sure everyone understood the game by going through the payoffs with each participant.

The first part of the experiment consisted of four rounds, similar to the ones in the pre-pilot experiment. In all rounds the participants were given their own position and the position of one

candidate on the ideological axis. The “You”-position was again varied to be left or right. The distances to the same candidate “C” were different in all three rounds, the first and third rounds having the distance be 6, and the second and fourth rounds having a distance of 4. The number of parties was also varied – in the first two rounds the number of parties was 5 and in the second two rounds – 7. For all the rounds the positions of the voters were the same.

The second part of the experiment also consisted of 4 rounds. As in the first part, the number of parties was varied by every two rounds to be 5 or 7. In this part the positions of the voters were varied to create 4 different positioning groups along the ideological axis. The participants did not have information on the position of any of the candidates. Thus, they had to rely on the additional information. The participants were given the additional information on paper slips, placed in sealed envelopes. They were instructed that each opened envelope was a purchase of information and had to be marked as purchased with a cost of 1€. For every round the participant was presented with a new set of envelopes they could freely choose from. (For examples on the three different round types and the additional information slips, please refer to appendices 2, 3 and 4.)

The participants were instructed to vote for their preferred candidate by writing the letter of their chosen candidate in the designated space. After that they had to calculate their payoffs for that round using the formula $(10 - X) - (1\ x\ Y)$, X being the distance between the ”You” point and the chosen candidate, and Y being the amount of information acquired. The participants were also asked to transfer their payoff result on an additional payoff slip (see Appendix 6). After completing all the rounds, the participants were asked to fill in a survey (see Appendix 5) through which all the background information of the participants was received. At the very end of the experiment a round and a participant were selected using an online random number generator.

7. Prediction

To state the expected results in accordance to the theory of utility maximization and rational behaviour, a prediction is formulated before conducting the experiment. These predictions assume that the individual wants to maximise their profit. It is noted that in a real-life situation there might be other factors governing the individual's decision making than profit and probabilities. However, these are not of interest to the purposes of the thesis and therefore are not included in the predictions or results.

In the probabilistic sections, the predictions were based on calculating the payoff by varying the amount of information and the distances to the candidate chosen. This method was also used when the distances between a candidate and the "you" point were chosen for the experiment, and when the amount of costs to be paid per information piece purchase was decided. In the first section, an overall expression of information purchase choices is displayed. In the second and third sections the predictions for the pilot experiment parts are discussed separately. Finally, ambiguity and risk aversion are discussed as predictors of individual behaviour.

7.1.Theoretical prediction

There can be a general prediction made about the decision to acquire information at each step. In order to show these predictions, each payoff is denoted as f. The payoff equation $(10 - X) - (1\ x\ Y)$ is used, where X is the ideological distance between the "you" point and the candidate chosen and Y is the amount of information retrieved. To vote, the participant must know the initial distance of at least one candidate. That information might be readily given. In this case let the initial known distance be m and the payoff the following:

$$f_1 = (10 - m) - (1\ x\ 0) = 10 - m$$

At this point the voter can choose whether they want to acquire more information or vote for this candidate. For it to be profitable for the individual to look for more information the payoff for the second decision, after paying the cost for the information purchased, should be greater than the first one, or $f_2 > f_1$. Or in more detailed terms:

$$(10 - X) - (1\ x\ 1) > (10 - m) - (1\ x\ 0)$$

$$X < m - 1$$

This equation shows that for the second profit to be bigger, the ideological distance in the first draw of information must be less than $m - 1$. And from the true value of m, the probabilities of that kind of an ideological distance being drawn can be calculated.

In the case in which there is no readily available information one purchase of information has to be made in order for the participant to be able to perform a payoff calculation. The payoff in this case is the following:

$$f_1 = (10 - m) - (1\ x\ 1) = 9 - m$$

The payoff without initial information is smaller in the minimal information acquisition situation, as one must pay for at least one information piece. To determine whether to purchase more information, one should compute whether $f_2 > f_1$, or:

$$(10 - X) - (1\ x\ 2) > (10 - m) - (1\ x\ 1)$$

$$X < m - 1$$

With a value known for m, the probability of drawing X can be calculated. This method of decision can be applied to each following step in order to calculate whether it is profitable to continue purchasing information.

To sum up, when deciding whether to purchase more information the following criterion has to be taken into consideration:

$$f_n > f_{n-1}$$

where n is the number of the next information piece and $n - 1$ is the current, or any of the previous information pieces, which generates the highest payoff. And more precisely:

$$X < m - 1$$

where X is any possible ideological distance to be drawn and m is the (smallest) known ideological distance to a candidate.

To make a "correct" decision on acquiring additional information, one needs to know the probabilities with which they could receive a better payoff. As there is no information on the distribution of parties, the participant can make estimations on overall probabilities.

7.2.Probabilistic prediction with initial distancing

In the first part of the pilot experiment the participant is given readily available information on one candidate. The payoff function, as mentioned in the previous section, is $(10 - X) - (1\ x\ Y)$. The decision to look for additional information would mean that the participant will have to pay 1€ for an additional piece of information and still make a higher profit than in their current position. In this case, when looking at probabilities with the more extreme ideological distance points the scenario is relatively clear. If an initial distance of 1, 2 or 3 is presented it is highly inadvisable to look for more information. If the initial distance of 10, 9, or 8 is presented it would be rational to look for additional information on candidate positions.

When considering the cost of 1€ per information piece in the case of an initial distance of 5, the probability of getting a profit is 33,33% (with a new acquired ideological distance of 1, 2 or 3 from the "you" position to the candidate), the probability of getting an even payoff is 11,11% (with a new distance of 4) and of getting a lower payoff is 55,55%. This would suggest that when paying for the information, at this point it would not be profitable to look for additional information. However, the 5-point distance was not added as an initial distance marker, because the association with the value of the number 5 would have been relatively neutral to the participant.

When including the cost of 1€/information piece for an initial distance of 4, the probability of gaining a profit is 22,22% (if the new distance is 1 or 2), of breaking even – 11,11% (if the new distance is 3) and of being at a loss – 66,66%. Therefore, it can be argued that additional purchase of information at a known distance of 4 would be risky. However, 4 is close to the middle ideological distance value, so there still is a probability to get a lower distance value. Additionally, the association with the number 4 can be good enough to deter individuals from looking for additional information. For these reasons the 4-point ideological distance was chosen as an initial distance.

With a given distance of 6, the probability of getting information on a party that is ideologically closer, with the included cost of 1€ per information piece, is 44,44% (with a new distance of 1, 2, 3 or 4), there is a 11,11% probability of getting the same profit outcome (with a new distance of 5), and a 44,44% probability that the information given is for a party that is further away on the ideological distance axis (with a new distance of 7, 8, 9 or 10). This is an interesting point to look at, as the gain and loss percentages are equal when considering the costs of information purchase. As there is an equal probability to get a higher or a lower payoff, it would not be advisable to look for more information. However, the number 6 might give an impression of being of a high distance value and therefore can give an association of loss in profit and consequently prompt the individual to search for more information. Kahneman (2003) titles this kind of a distortion of probabilistic facts "heuristic-induced bias" – a bias in judgement which occurs due to certain intrinsic cues.

With a distance of 7, the probability of getting a party closer to the "you" position and thus generating a bigger profit after paying 1€ for one information piece is 55, 55%, for getting an equal payoff – 11,11%, and for getting information on a party that is further away from the "you" point – 33,33%. In this case it is advisable to look for information, as it is more probable to get a result generating higher payoff. As the number 7 is already further from the smaller numbers, it will have negative payoff associations. That is why it was not chosen as an initial distance.

7.3.Probabilistic prediction with no initial information

In the second part of the experiment the participants have no initial information on the party positions. Therefore, they have to purchase at least one information piece to have an ideological distance with which to calculate their payoffs. In their first draw of information the participant gets a random initial distance marker. If the first draw of the voter is between 1 and 6, with their initial payment of 1€ for the first information on some candidate, it would not be profitable for the participant to look for additional information.

With a draw of 1 or 2 as the initial distance there is no possibility for a better outcome (as in the case of 2, having a daw of 1 can only even the outcome after payment for the additional information). In the case of 3 and 4 there is only 1/9 or 2/9 chance to have a better payoff outcome from the next draw of additional information. In the case of 5 as an initial distance there is a 33,33% probability to get a better outcome than the one at hand, 11,11% to get the same outcome, and a 55,55% probability to get a worse outcome. And in the case of a drawn distance of 6 the probabilities are 44,44% to get a better payoff, 11,11% to get an equal payoff and 44,44% to get a lower payoff. Therefore, it would not be advisable to purchase additional information when considering the probability of the outcomes with all of these first-drawn information pieces.

However, with the bigger ideological distances of 7-10 it would be more profitable to continue drawing information, as the probabilities for a higher payoff are favourable. With a distance of 7 the probability for getting a better payoff by drawing additional information is 55,55%, the probability for getting an equal payoff is 11,11%, and the probability for getting a lower payoff is 33,33%. In the case of drawing a first distance of 8 the probabilities are 66,66% to get a better payoff, 11,11% to get an equal payoff, and 22,22% to get a lower payoff. If the first drawn distance is 9, the probabilities are 77,77% to get a better payoff, 11,11% to get an equal payoff, and 11,11% to get a worse payoff. If the first drawn distance is 10, there is no worse outcome possible, 1/9 probability to get an equal outcome in payoffs and 8/9 probability to get a better outcome.

These probabilities have concerned only the first draw of information in a situation where there is no information or the profitability of getting any information in a case of initial distances. As the participants will not have knowledge on the distribution of the parties along the 10-point scale of ideological distances, these probabilities are not easy to compute further on. There is an ambiguity problem, which translates into an ambiguity aversion question in the decision-making process.

7.4.Ambiguity and risk related attitudes

As the individual is not given information on the distribution of the parties within the 10-point possible distances, they cannot make accurate predictions on probabilities. Not providing the distribution gives way to ambiguity-related individual attributes. These are separate from the risk-related inclinations. Ambiguity aversion, neutrality or love is related to imperfect information on the possible outcomes of a decision. Fox and Tversky (1995) state that this situation is close to reality, especially in such situation as medical treatments or in business life. As already stated the voting situation is similar – one cannot always have all the information unless they invest the time and devote themselves to it.

Moreover, Fox and Tversky (1995) show in their comparison of multiple studies in which ignorance and ambiguity were juxtaposed, that comparison of events or people seem to drive ambiguity aversion. They also argue that this comparison in "realistic", as when something is unknown individuals tend to solve it by relating in to something similar (Fox and Tversky, 1995). In this case, the participants will have the numbered distances to associate to previous rounds, but more prominently they will associate the distances to the number's value within a 1 to 10 point scale.

Attanasi, Gollier, Montesano and Pace (2014) investigate ambiguity aversion in their experimental paper with a ten-round game. In their experiment, similarly to this thesis' experiment, one of the treatments is with an unknown distribution. They show in their prediction that in case of uncertainty of distribution a positive signal will always be favoured, but in the case of a negative signal or total ambiguity, total ambiguity will be preferred (Attanasi et al., 2014).

In another paper, Attanasi, Corazzini, Georgantzis and Passarelli (2014) look at risk aversion. The interesting thing here is a similar division of no information on distribution in one treatment, and favourable or unfavourable probabilities in a voting context. Again, it is shown experimentally that signals have an impact on confidence, with a tendency to shift beliefs towards the median. However, it is shown that this confidence is not related to risk-aversion.

(Attanasi et al., 2014.) In this case the disruption in perception leads us back to ambiguity-related attitudes.

Taking into account this ambiguity-related literature, a prediction can be made about the experiment, that when the voter is given an initial distance of 4, they will overestimate their winning chances and not look for information. In the case of a negative signal of a distance of 6 – they will underestimate their possibility to win, so they will look for additional information. Additionally, the participants are presented with differing candidate numbers, 5 in half of the rounds and 7 in the other half of the rounds, which in terms of outcomes and probabilities should not make a difference. However, due to initial association, individuals might see the size difference as an important factor and behave differently in the treatment. The third treatment of electorate composition could have an impact in a strategic setting. Additionally, as the participants will not be informed about whether their position and the other participants' positions are the same or different, this treatment will most likely not have an impact on voter decisions.

Another individual feature that can make the individual behave differently in relation to the other participants is risk-related attitude. As Eckel and Grossman (2002) state in their paper risk can have different applications depending on the context. In the context of this thesis and the experiment risk will refer to the choice of whether to purchase information when at least one distance is known. There are three types of risk attitudes– risk aversion, neutrality or seeking behaviour. In this context it could be said that a risk averse individual would not look for information if he/she already has information on a candidate whose ideological distance to him/her is 6 or less. A risk neutral individual would be an individual who would not invest in information when their known distance to a candidate would be 5 or less or 6 or less (depending on what associations they make). And a risk seeking individual would look for information whenever there is a possibility to gain a better payoff by purchasing more information.

However, it should be noted that there might be circumstances affecting the risk attitude of the individual. For example, Eckel and Grossman (2002) found that even though it is stated that men and women differ in their risk attitudes, there should not be presumptions made on

behaviour only based on gender differences. As there is no assessment of risk attitudes, there will be no speculation on behaviour in the experiment regarding risk attitudes. However, it is important to point out that individual risk attitudes, as well as the individual ambiguity attitudes will play a role in shaping the end decision of the individual voter.

8. Experiment findings

The aim of this chapter is to present the findings of the conducted experiment. As the next chapter focuses on a discussion of the findings, a more descriptive approach is taken here to specify the subject pool and the results. Firstly, the sample is described. Secondly, the overall results and data are described and finally, an overview of the individual-bound data is given.

The experiment conducted follows the within-subjects design. Charness, Gneezy and Kuhn (2012, p. 1) describe the within-subject design as one in which an individual is exposed to multiple treatments and through which behaviour change with contextual change can be observed. The authors point out that this type of design helps with increasing the data points in low participation experiments, but caution against a contextual bias in which decisions are affected by already presented information (Charness et al., 2012). In this experiment it is acknowledged that there is a possible learning curve. However, it is not seen as bringing too much bias to the individual, as the learning curve is anticipated. Moreover, it is realistic to assume that in a voting situation there is a certain repetition of events, as voting is not an independently occurring event.

In addition, due to the small sample size of the experiment there will be no econometric analysis run, as the results would be biased and unrepresentative of the true nature of decision-making with ideological distancing. Most of the results are presented through descriptive statistics. All the analysis and the graphs were produced using R and Excel. The raw experiment results from the rounds and the survey can be found in Appendix 7. The data was reconfigured in a couple of sets to make the analysis easier. This chapter first investigates the sample of the experiment by describing the survey responses. The second section gives an overall description of the results. The third section looks at the different treatment results. The chapter concludes with an overview of the within-subject results.

8.1. Sample description

The full duration of the pilot experiment was 45 minutes. The participants were given 3 minutes to complete each round, but only in the first round the full time was needed to complete the rounds. In the rest of the rounds participants took from 1min 40sec to 2min to complete a round.

After the experiment, the round chosen for the payoffs by the random number generator was round 3 and the individual chosen by the same method to receive their payoffs in cash had an ID number 6. The participant was paid their 3 € earnings in cash and the rest received chocolate candies according to their payoffs.

In the initial analysis stage of the pilot experiment it was noted that one of the participants was an outlier – their payoffs were clearly different from those of the other participants. They received a lower range payoff in almost every round, with payoffs having even negative values. Through their survey responses – they did not vote and were not too interested in political voting - and the sporadic nature of their payoffs it was concluded that the participant did not understand the game (as self-reported only until round 2). It was thus decided that this subject was to be removed from the analysis.

The end sample consisted of 8 students. Only one of these participants was male, so there was no possibility to look for gender effects on voting choices. Half of the participants (4/8) were exchange students, 3 of the other half of the participants were studying on a Bachelor-level and 1 was studying on a Master-level. All of the participants currently studied in the University of Tampere. The group was international – 3 participants were from Finland, 2 from South Korea, 1 participant was from Japan, 1 from China and 1 from Spain. This is important as it speaks to the system the voters are used to.

In China there is a one-party system, whereas Finland, Spain, South Korea and Japan have a multiparty system. However, in the Spanish case until 2015 there was practically a two-party system in place (Orriols and Cordero, 2016). In Japan there are multiple parties in elections, but one party usually dominates the government ("Japan - Politics, government, and taxation", 2018). Finland ("Finland – Government", 2018) and South Korea ("Korea, South – Politics, government and taxation", 2018) seem to be the countries with a more "real" multiparty system, in which multiple different parties can be included in the government to drive their policy solutions. It can be expected that especially the countries with an active multiparty system have prepared the participants to think about elections in a certain way. Although this

is not necessarily the case, because voting is the context of the experiment the political system in state might make it easier for the participants to understand the concept of the experiment.

And in fact, there seem to be some cultural effects in the experiment. Although there are no conclusive results, it seemed that Finnish participants understood the experiment more easily. Additionally, only European participants reported to voting and looking for information always when possible, whereas Asian participants reported to voting only when feeling it is necessary or not necessarily looking for information on candidates when voting. Moreover, the participants who always voted in a multiparty system were the ones with the highest payoffs in the practise round.

From the survey responses it was found that 5/8 participants voted every time they could, 2/8 voted in elections only when they found elections to be of personal interest to them and 1 participant stated that they voted due to a sense of duty or because urged by their families to do so, and not as a form of affecting the state of the world. All participants reported they searched for information about the candidates or parties when voting. Most, 5/8, reported they always searched for information when voting, whereas the rest, 3/8, reported to looking for additional information only sometimes when voting.

Almost all (7/8) participants reported on getting their information about political parties and candidates on the media – both traditional and social sources. 75% of participants reported to searching for information on their own when looking for a suitable party or candidate to vote for. Half of the participants said they had conversations with their friends and family to get information on possible candidates to vote for. None reported to utilizing other than the mentioned sources, or to speaking with political experts or the candidates themselves.

In the survey, the participants were asked about the way they played and what motivated them to make the choices they did. 3/8 of the participants stated they were mindful of their payoffs and most of them wanted to keep the payoff above 5. Half of the participants were mindful

about the amount of information they purchased and wanted to minimize the information acquired. One mention of a cap of 3 information pieces was noted.

3/8 of the participants reported they had distance considerations – 1 of them aimed for less than 5, whereas the other 2 considered a distance of 3 or less as ideal. One of the participants mentioned they wanted to minimize risk in decisions and one mentioned being mindful of the candidate numbers (whether there were 5 or 7 parties). All these reports are very interesting, as they align with the theory but not necessarily with the actions of the individuals. These considerations will be discussed further in the within-subject section and in the next chapter.

8.2.Overall findings

From the practise round results it was confirmed that a test round through which the principle of the game is to be learned is necessary, as only half of the participants managed to generate the highest profit when all information was presented to them. (For a reference on the practise round, please see Appendix 1.)

The three variables that can be investigated as a result from the experiment are the information amount required, the distance to the chosen candidate and the resulting payoffs acquired. The summary of these variables for all the rounds conducted can be seen in the following table.

Table 2. Overview of the experiment results

Variable	***N***	***min***	***max***	***Mean***	***Median***	***Standard deviation***
Payoff	64	2	8	5,70	6	1,60
Information amount	64	0	4	1,77	1,5	1,16
Distance to chosen candidate	64	1	6	2,59	2	1,31

From Table 1 it can be seen that overall the payoffs were high. The highest possible amount to be earned as a payoff was 8 and it was achieved 12,5% of the times. Additionally, the mean

and median are closer to the maximum value, than the minimum. This overall result is in line with the reported motivation of the participants to maximize their profits. Moreover, it is in line with the prediction and presumption that the individual will try to maximize their profits.

As seen from the above table, the amount of information acquired was low overall. It can be noted that there was a tendency to acquire towards the minimal amount of information possible, which was reported to be a motivation by some of the participants. In some of the rounds 4 was the maximum amount of information the voter could acquire (in the cases were there were 5 candidates and readily available information on one of the candidates), so also the maximum amount of information was acquired.

The distance chosen to the selected candidate also tended to be minimal, although also a distance of 6 was chosen once. Although it was stated in the prediction that the distance of 6 is a rational one, it can be seen that many of the participants did not view 6 as a favourable distance, but rather wanted to minimize the distance to the candidate. Based on these results and the reports it is hard to say what motivated the individual the most to make the choices they did – was it the distance, payoff or amount of information. As the aim of the thesis is to look at the information acquired and the incurring costs with relation to the utility, or in this case payoff, these two variables and the distance to the preferred candidate are displayed in the following graph.

The averages of each round, in payoff, distance and information acquired are displayed in the below Figure 1. The averages were chosen instead of median, because the number of observations is few and in order to get a more accurate comparison, a more precise value is presented. From the figure it can be seen that the highest paying round is round 5 with an average payoff of 7.125. The lowest payoff round in the experiment is round 2 with an average of 4.875 in payoffs. In the figure it can be seen that the highest distance to the chosen candidate is in round 2 with an average distance of 3.75 to the candidate. Whereas the least distance to the chosen candidate with an average 1.625 is chosen in round 5.

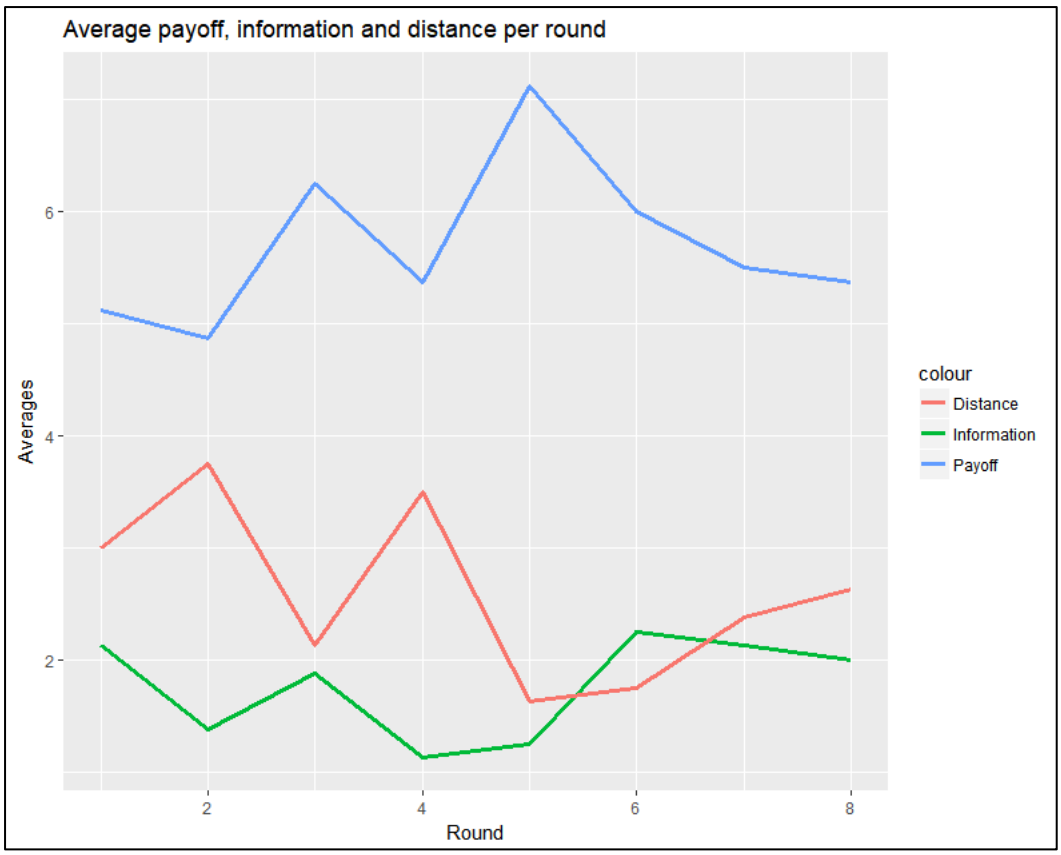

Figure 1. Average payoff, information and distance per round

It can be seen in Figure 1 that the least information is acquired in round 4 with an average of 1.125 information pieces purchased. In the second treatment, starting from round 5, where the participant had to purchase at least 1 information piece in order to get any information on a candidate and calculate their payoffs, the least information was retrieved in round 5 with an average of 1.25 information pieces retrieved. Interestingly, that is also the second lowest average amount of information acquired in the experiment. The most information was acquired in round 6 with an average 2.25 information pieces purchased.

As a general, the directionality of the distances to the candidate chosen and the payoffs are opposing – the more distance between the candidate and the voter, the less payoff the voter obtained. In contrast, the directionality of the average amount of information acquired and the payoffs are the same – with more information there seems to be higher payoffs. In round 5, nevertheless, there is a difference in directionality – there is very little information acquired and the payoffs are the highest of all rounds. As was stated above, not only was the information

amount one of the lowest on average, also the distance to the chosen candidate was one of the shortest on average for all the participants. Additionally, when conducting a Welch's t-test to compare averages of information acquisition in all the rounds, the fifth round – the first one in which the participants were presented with no information on candidate positions – stood out. Therefore, when investigating these results, it seems more likely that the difference in round 5 occurred by chance, than the round being notably different because of its treatment or other characteristics.

A Welch's t-test was conducted to compare means between rounds (for all of the results of the Welch's t-test, please refer to Appendix 8). When running a t-test in R, a Welch's result was displayed because of unequal variance. The differences in averages per round for the variables can be seen from Figure 1 but by conducting the t-tests it could be seen whether there is a significant difference between rounds and treatments. It is worth noting that because of the small sample size any significance should not be treated as having universal validity. However, if there are significant differences they may suggest the need for further investigation.

When comparing the average amount of information acquired between the rounds there was an instance where the p-value was smaller than 0.05. In round 6 participants looked on average for 2.5 information pieces more. This difference is significant with a p-value = 0.03244. However, as established, round 5 was an odd one out in terms of the amount of information acquired. In the payoff related Welch's t-tests round 5 also stands out in its significance, as evident also from Figure 1.

When conducting the Welch's t-test for the distances between the voter and the candidate chosen there were even more significant differences. This can be anticipated from Figure 1, where there is more variance in the average values of the distances, especially when compared to the two other variables displayed. As in the case of the information acquired, the highest average value is the significantly different one - round 2 is significantly different, but this time from rounds 3, 5, 6, 7 and 8. Additionally, round 4, the second highest in distance to the chosen candidate, is significantly different from rounds 3, 5 and 6. This is not a surprising result as these three rounds are the lowest paying ones.

It could be said that the conducted t-tests confirm what can be seen in Figure 1. The outcomes for payoff and information seem steadier on average for each round, whereas there is more variance in the distances between the voter and the chosen candidate. As the sample is small, it is not possible to conduct any further analysis on the relationship between the variables. However, with a larger sample it could be investigated how information acquisition and the cost considerations related, as well as the ideological distancing affect the payoff alongside with other variables.

8.3.Treatment findings

Different treatments were introduced to the participants to see whether behaviour would be altered with changed contexts when making voting choices. To recap, the treatments consisted of varying the initial information about a candidate (whether they had none, or the candidate was situated at 6 or 4 distance points from the "you" position), varying the number of candidates the voter could choose from (5 or 7 candidates in the election) and varying the electorate type (heterogenous or homogenous).

In Figure 2 the three different initial information treatments are displayed. In these the initial information given readily to the participants is varied. The information amount here is the final information amount purchased by participants in the treatment. In the first graph of red bars, the information acquired for the rounds with initial distance of 6 is displayed. In the second graph, with blue bars, the acquired information amount for initial distance of 4 is displayed, and in the bottom graph with green bars information amount for the rounds with no initial information is displayed. The dashed red line in all the graphs represents the mean amount of information retrieved in each treatment. It should be noted that in the last graph, the information amount is from observations in 4 rounds, whereas in the first two, the data is from two rounds. This difference in observation numbers is not seen as a problem, as the aim is to look at overall differences. However, the results are not conclusive and should not be considered as such.

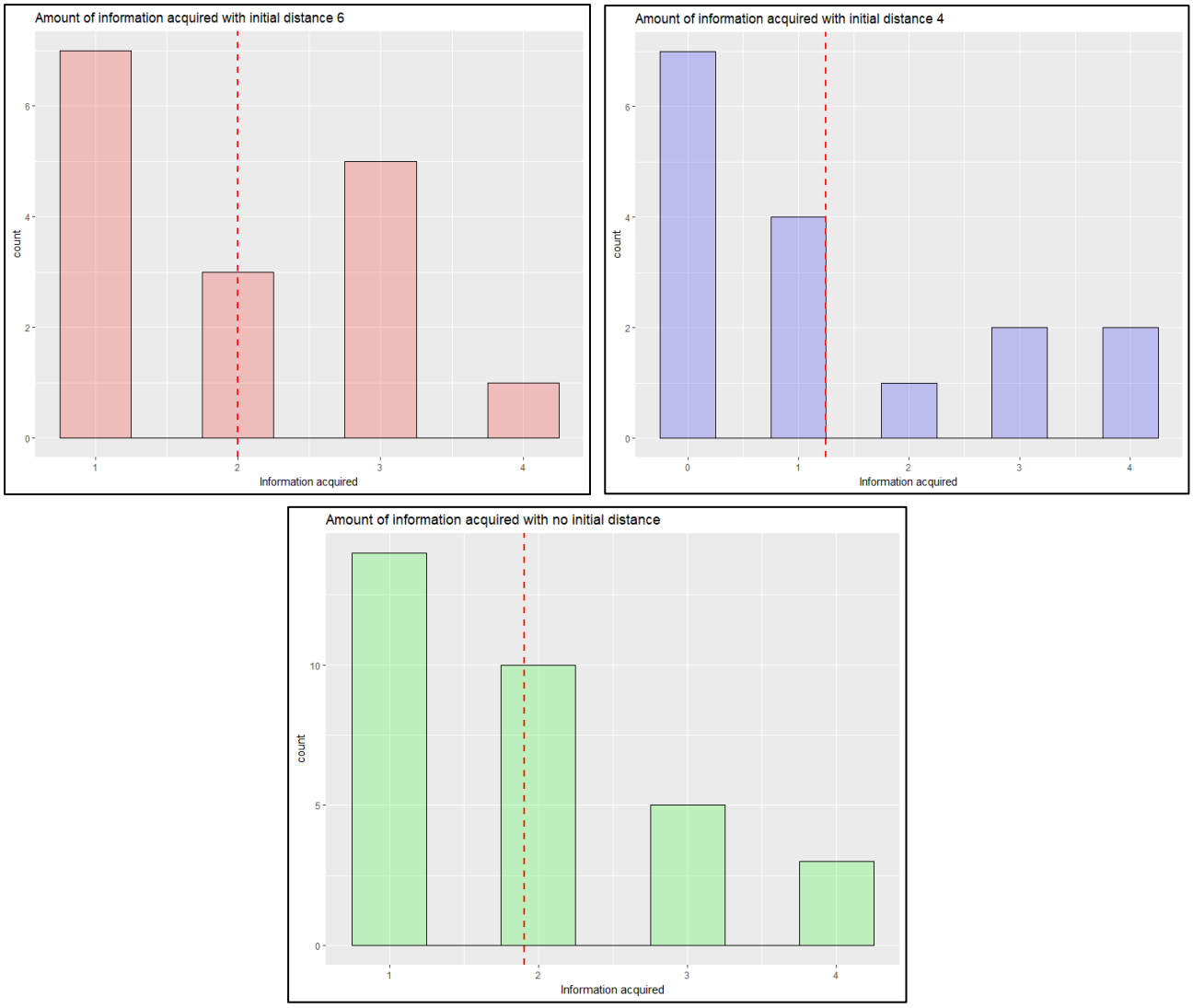

Figure 2. Amount of information acquired per initial distance treatment

The interesting result here is that the only treatment where no information has been acquired is the treatment where an initial distance of 4 was given. Moreover, there is a difference in means: the least information was gathered in the initial distance case of 4 – 1,25, the middle amount in the no initial information rounds – 1,91, and the most information in the initial distance case of 6 – 2. The differences are not significant according to the conducted Welch's t-test, but they are in line with the prediction and the existing ambiguity aversion literature – in a case of a positive signal it is seen that there is no need to acquire much information, and when the signal of the distance is negative, the perception of need to acquire information is heightened, although in terms of probabilities it is not rational to acquire information.

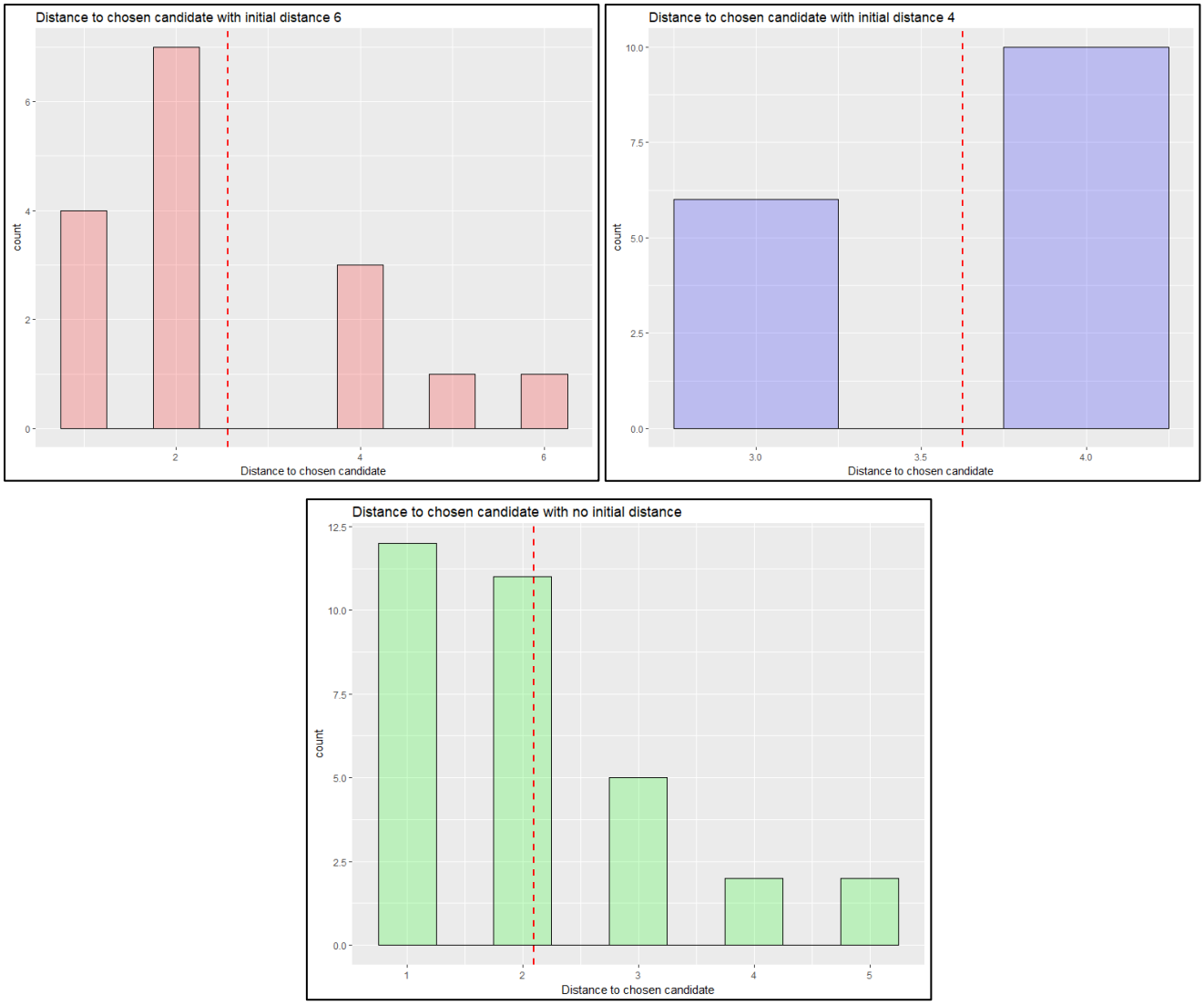

Figure 3. Ideological distances to the candidate chosen by initially given distance

As the treatments with initial or no initial distancing and the type of electorate (homogenous or heterogenous) coincide, only information on the initial information is not enough. It is necessary to consider the other important variable, the distance to the chosen candidate, to see how it is related to the final choice made by the participant. Figure 3 shows an interesting result in the treatments. In the case of initial information on a candidate positioned at 6 ideological points from the voter, and with additional information acquired as was seen in the previous graph, the voters had varied distances to their chosen candidate. A similar result can be seen in the no initial information case where they had to purchase at least some information. However, in the rounds in which the voter had information about a candidate at a distance of 4, the final distance chosen in all the 16 cases was either 3 or 4.

The mean distances in the treatments show that the least ideological distances were selected when the participants had no initial information (2,09), a further initial distance was chosen when the initial known distance to a candidate was 6 (2,56) and when the voter had initial information on a candidate at a 4-point distance they chose on average a candidate with the most ideological distance to them (3,62). The Welch's t-tests show that with this data the difference in average distances chosen with initial information of 4 in relation to the other two treatments is significant.

When taking the information displayed in Figure 2 and 3 it can be seen that the treatment rounds with least information produced choices with further ideological distancing than the ones with more information. This aligns with the theory, as rational choices can only be made when the individual is informed enough about the candidates' positions, especially when considering the treatments with initial information. With no initial information, the results do not definitely follow this logic, but as stated, there is a round within the treatment that might skew the results.

Another treatment variation was the one in which the candidates to choose from were either 5 or 7. Although one participant reported in the survey that they took the number of candidates into account, there weren't any results pointing towards a difference in treatments. The averages of information acquired, ideological distanced to the candidate and payoffs were similar. This was thought to be the case in the prediction, as when there is no signal about the distribution, the candidate or party number does not matter. And the perception of difference did not produce differing results. However, if we look at the chosen candidates and the election results, there were two cases in which there was no winner by a majority of votes. Both of these instances occurred when there were 7 candidates involved. These results might be pure coincidence. However, the candidate's success in elections is outside the scope of this thesis and thus this matter will not be discussed further.

8.4. Within-subject results

The design of the experiment follows a within-subject design. Therefore, some attention has to be given to the individual choice-making patterns of the participants and their attitudes towards

voting. In this section the survey responses and the results from the experiment are built to make voter profiles, which better explain the outcomes of the experiment.

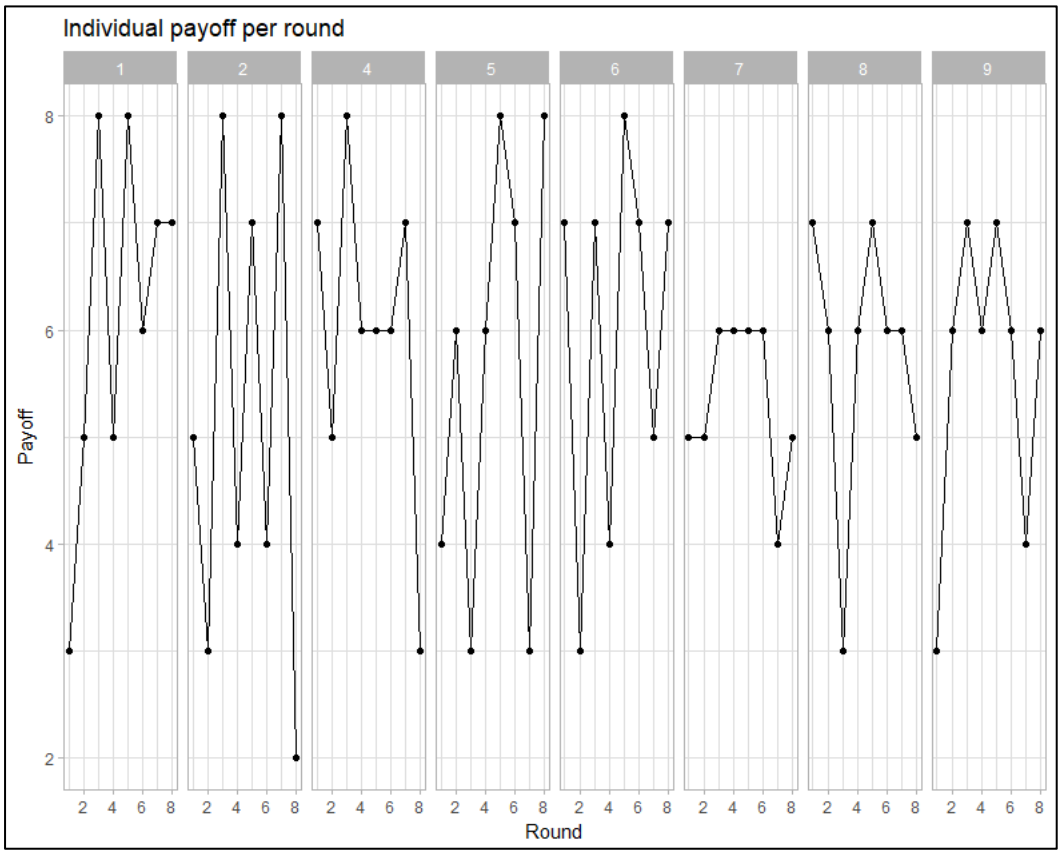

Figure 4. Participants' individual payoffs per round

In Figure 4 the payoffs of the individual participant for all the rounds of the experiment are displayed. Individual results are in their separate sections with ID numbers on top, round numbers on the bottom x-axis and the amount of payoff on the y-axis. It can be seen that half of the payoffs per individual are between 3 and 8, with one participant having a payoff of 2 in round 8. Participants' 8 and 9 payoffs have a narrower scope with payoffs between 3 and 5 for all rounds. Participant 7 stands out with consistent payoffs between 4 and 6. This participant reported to being mindful of their payoffs and trying to keep them above 5, which they mostly manage to do.

As the payoffs are an outcome in the experiment, it is more interesting to look at the variables which contributed to this outcome. By understanding the decisions made, the utilities of voters

can be better understood. Therefore, in the following Figure 5 the individual information acquisition amounts per participant for each round are displayed. From the graph it can be seen that there are 3 participants (5, 8 and 9) who behaved as predicted and did not purchase any information when the initial information given was 4. Interestingly, half of the participants always purchased information, but this was not the same majority who reported to always looking for political information when voting. In fact, only participants 1, 2 and 6 both reported to always looking for information and in fact looked for it in the experiment. Participants 8 and 9 who reported to always looking for information when voting in real life, were satisfied with an ideological distance of 4 in the experiment.

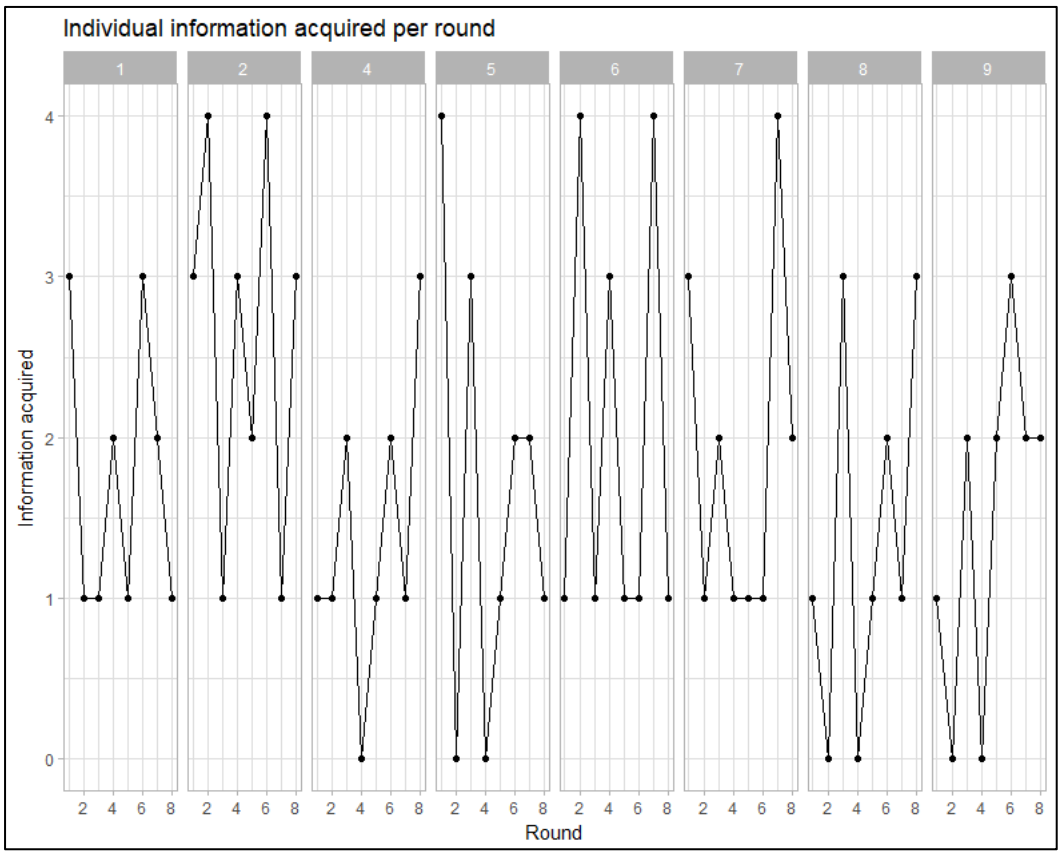

Figure 5. Participants' individual information acquired per round

When comparing the two initial information rounds, it can be seen that for Participant 1 there is no pattern of behaviour in information purchase between treatments. With participant 4 the amount of information purchased varied only when the number of parties was 7. Participant 7 did purchase less information in the 4 distance treatments, than in the 6 ones. A very interesting

behavioural pattern can be seen in the amount of information participants 2 and 6 acquired. They acquired less information when the initial ideological distance was 6, and more when the initial distance was 4, which is opposite to the prediction.

In the no information treatment all participants with the exception of Participant 7 looked for more information in round 6 that they did in round 5 (which was previously determined to be an odd one out). Otherwise there does not seem to be any pattern to the information acquisition in the treatment.

When considering also the survey responses, it seems that the participants who were mindful about the amount of information they should purchase were the half that did not purchase more than 3 pieces of information. As stated, the frequency of search for information when voting in real life and the information acquisition amount here did not necessarily match. Additionally, no other connection was found between the survey responses and the outcomes of the experiment.

In the survey responses some of the participants reported to certain distances being a criterion for their decisions. For the most part these were evident in the results of the experiment. The ideological distance between the candidate chosen and the "you" position of the voter for each round is displayed by individual participant in Figure 6. As can be seen all participants with the exception of Participant 9's first round chose a candidate who was at a maximum of 5 ideological distance points away from their own position.

Participant 6 reported in their survey responses that the cap for a distance for them was 3, and it can be seen from Figure 6 that they kept that principle throughout the experiment. Participant 4 also stated to have been looking for a candidate with a distance of less than 5. From their results it can be seen that they kept this distancing plan. Participant 8 reported to have aimed at 3 distance points or lower, but in their results, it is not obvious that they tried to do so. However, Participant 8 also stated to be unwilling to purchase a lot of information.

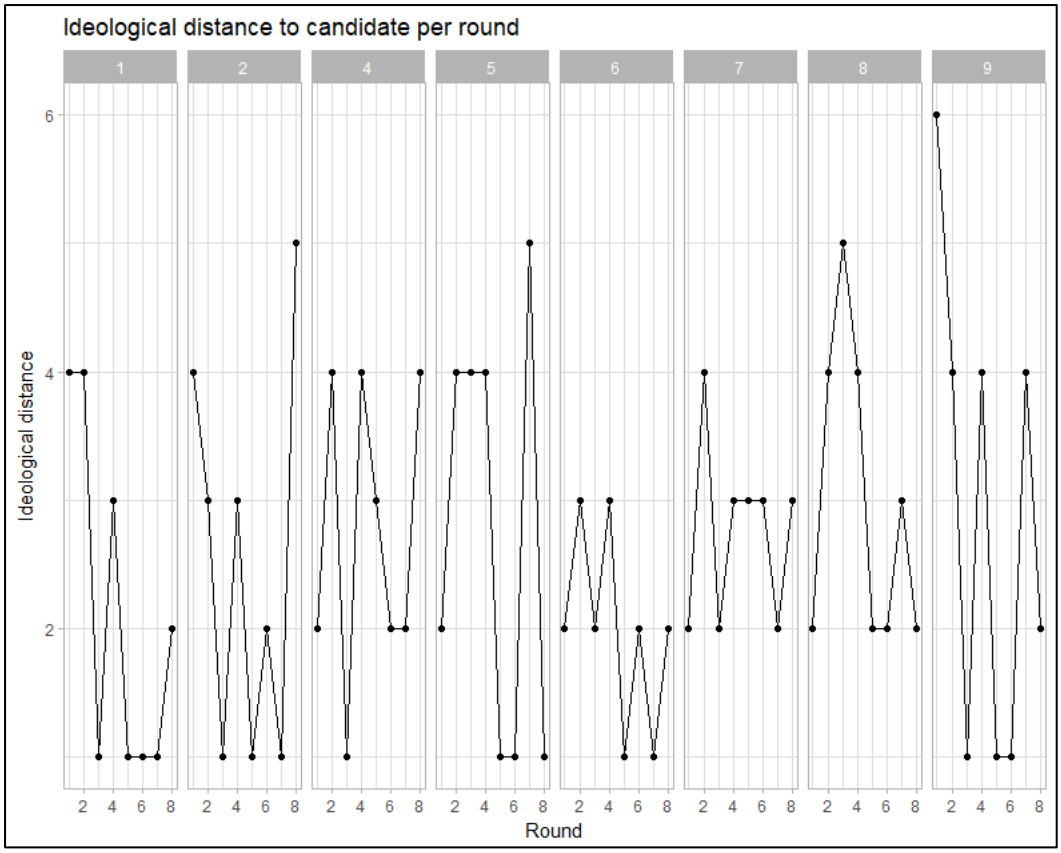

Figure 6. Participants' individual ideological distances to the chosen candidate per round

An interesting result can be observed in the chosen distances, especially with participants 1, 6, 7, 8 and 9. All these participants had their highest distance to the candidate in the initial information rounds. Especially with participants 1, 6, 7 and 8 the difference between the treatments of initial or no initial information is notable.

To be able to make more accurate statements on how the individuals chose which candidate to vote for it is beneficial to look at the full picture. Participant 1 had the highest payoff on average from all their rounds (6,125). They reported to looking for best distances with the least information possible. Although no clear pattern can be seen from their choices, it could be seen that their distances were lower than the median, and the information amount was slightly higher than the median. Participant 2 had the lowest average payoffs (5,125) but retrieved the most information (2,625). Their distancing was quite varied but lower than the median (2,75). Additionally, in the rounds with initial information they voted for a candidate who was closer than the given one.

Participant 6 had on average the least distance (2) to the chosen candidate in all the rounds. This participant acquired information always, but still had close to the highest average payoff (6). Participant 8 had the most distance on average for all the rounds to their chosen candidate (3) and was one of the participants who acquired the least information (1,375) on average on the positions of other candidates. The participant's payoffs were quite varied, but higher than the median (5,69). The other participant with low information retrieval (1,375) was participant 4. Their distance to the candidate chosen corresponded with the median of the sample (2,75).

To sum up, the overall results seem to be as predicted and as found in previous literature. Information does increase the payoffs from voting, but only up to a certain point. The distance to a candidate is important only when the ideology is of interest to the candidate, otherwise the individual might settle for a good enough candidate. The initial information treatments seem to have been the most influential to the behaviour of individuals. However, upon closer inspection of individual decision-making it can be observed that participants had different incentives for choosing the candidate they voted for.

9. Discussion and Future possibilities

This chapter aims to discuss further the abovementioned results and to give suggestions for future developments on the voting decision-making processes in a multiparty system. In the discussion section the hypotheses are reflected in light of the results. Additionally, the results are discussed in relation to the existing literature. In the second section possibilities to improve the study, both in more general terms and in a context of a doctoral dissertation are discussed.

9.1. Discussion

As the aim of the thesis is to look at a multiparty system and the voting choices in it, the model and experiment follow a more diverse selection of information and candidates. This is what differentiates the study from previous studies. The pilot sample is small, but it seems to follow previous findings and the predictions made.

The main research question in the thesis is how information acquisition and the related costs influence the voting choice. The main hypothesis states that information in itself will enhance the voting choice, whereas the related costs will affect it negatively. There is support for the hypothesis already in the theoretical model – the probability of the signal of the state of the world being correct and the probability of the knowledge about the state of the world being correct, as well as the ideological distancing being accurate increase with the increased amount of information acquired. This is further supported by the experiment findings. As described and seen in Figure 1, with an increased amount of information in almost all the cases, the payoffs are also increased.

The negative effects of information acquisition costs on the utility of the voter can be seen from the model. The costs, relative to the amount of information acquired and the inherent skill of the voter, are the only variable to be deducted in the model. This observation is in line with sub hypothesis 1, which states that the costs are influential to the utility of the voter. The magnitude of this can be seen especially when we look at Participant 2's individual outcomes in the experiment. The participant looked for the most amount of information but generated the lowest payoffs, which comes to show that there can be a point after which information becomes too costly.

This brings us to sub hypothesis 2, which states that there is a limit to information acquisition which is seen as the amount necessary to make a rational decision in the voting choice. As rationality in this thesis, and in a broader economic sense, is tightly linked to profit, it could be said especially in the context of the experiment that looking for information is reasonable up to the point when it is more likely to decrease one's payoff by purchasing additional information. The overall probabilistic thresholds for looking for information are described in the Predictions-chapter and show that it is not advisable to look for information when one already has knowledge on a candidate who is at a 6-point distance, or a smaller distance, from the voter.

Moreover, this prediction contributes to sub hypothesis 3 which states that the type of initial information can guide the willingness to acquire information. The costs play a considerable role in determining the thresholds in considerations of whether to purchase additional information with adding up the costs of each information piece. However, when there is initially available information, the voter might behave differently and not engage so eagerly in information acquisition, as can be seen in the participant-specific results in Figure 6. Nevertheless, previously known information and the previously known distances, as well as the individual considerations of the voter have the most influence on the final distance between the voter and the chosen candidate.

Going back to sub hypothesis 2 – there are individual differences in thresholds of information which arise from personal considerations. As stated in previous literature (e.g., Brown, 1970; Ha & Lau, 2015; Coleman, 1988) and as modelled in the utility function, individuals have differing incentives when they vote. Some individuals consider ideology and policy solutions to be the defining features by which they choose their representative, whereas others place more value in personal considerations. These considerations include ingroup opinion and personality characteristics. This disparity in incentives is considered in the model with the introduction of the Ghosal and Lockwood (2009)-inspired weight variable. Although the model and the experiment in this thesis are centred around the ideologically bound considerations of the voter, it is noted that other motivators exist in defining the decisions made.

The difference in choice motivators is also evident in the results, as the choice patterns of individuals are dissimilar. However, the disparity of these participant-bound considerations is made even clearer through the survey responses. Some of the participants chose to create thresholds of distances which to follow, some were mindful of payoffs or amount of information acquired. Additionally, there was a mention of risk, and surely risk attitudes had their influence in individual choice-making, alongside with ambiguity attitudes.

There could be speculation about the interest in ideological standing, or the correctness of the state of the world according to the voter. For example, participant 4 reported to vote only because they felt obliged and not for any policy or ideology-related reasons. In the experiment this participant was also one of the two participants to acquire the least amount of information. Therefore, it could be speculated that this participant votes for reasons outside the ones captured by this experiment. And when considering the model, their λ value (weight of personal considerations versus state of the world considerations) would come close to 0, making their utility from voting in an ideologically rational manner close to 0. However, these considerations are highly speculative and there is no accurate way to quantify them in this context.

As stated, the purpose of this thesis was to conduct a pilot experiment and see whether there is reason to study further the impact of information and the related costs on the voting choice in a multiparty system. The results of this experiment seem to suggest there is a need to further research, especially as there is so little studies conducted in the multiparty field where information and options are more diverse. In the following section suggestions are made on how to improve this study.

9.2.Future possibilities

As the aim of the study is to look at a multiparty setting, in the future it would be interesting to compare two different nationalities with different political systems. As reported, there seem to be differences in understanding the experiment that varied with frequency of voting and number of candidates or parties the individual was used to in their personal voting experience.

Therefore, there could be two samples – for example one from Finland, with a multiparty system, and one from the USA, with a dual-party system – for which the experiment would be the same, but through which it could be seen whether the context of voting in this kind of decision-making setting would be different according to background and personal voting experiences.

As the ambiguity-related behaviour is very interesting, the treatment variations could be cut to include only variation in initial information and distancing. Alternatively, if there would be a need to be more realistic in attaining information on distribution of parties alongside an ideological space, the number of parties could be varied, as to investigate whether there are effects from party or candidate numbers. In this case there could be a variation on the composition of the electorate. However, this kind of an investigation would require the inclusion of strategic behaviour, as with information on distribution and party numbers there would be altered preferences for voting. A new goal for the voter will form, as the chosen candidate's winning an election will define their outcomes and they might not vote according to their true preferences, as suggested by Tyszler and Schram (2016).

Most importantly, the sample size in further studies needs to be extended depending on the different treatments included in the investigation. With an increased observation pool, it will be possible to conduct more precise analysis using econometric tools like linear regression (more precisely, Ordinary Least Squares) to pinpoint and quantify the drivers for information acquisition and their relationship to the voting decision made. It would also be possible to investigate which factors are the most important in determining the voting behaviour with expanding the experiment and the survey questions.

All of the abovementioned considerations will be taken into account in a doctoral dissertation, where the voting choice will be expanded to include a more social aspect of the voting choice. It is evident from this thesis that ideological or policy-related considerations cannot fully explain voting behaviour. As the discussed literature (e.g. Coleman, 1988; Ha & Lau, 2015) suggests individual considerations might overpower the economic personal considerations when voting decisions are formulated. It would be interesting to see whether culture and the

related normative behaviour and belief-systems have an influence on how individuals form their decisions, and whether these predetermined beliefs can be altered in light of new convincing information. A dissertation is a wonderful opportunity to take this thesis – its model and findings – and develop a more encompassing model, as well as conduct a larger scale experiment to attempt to better explain decision-making in a multiparty system and investigate the reasons and impact of information acquisition and the related costs to the utility from voting correctly.

10.Conclusions

10.1.Introduction

This thesis aims to take a multiparty viewpoint to the much-studied field of voting behaviour. The focus here is on the initial stages of voting, when the individual formulates their opinion on the current state of the world and their own standing on policy and ideological decisions and relates them to the candidates and parties running for election. The approach taken in this investigation is an economic and utility maximizing one. This study seeks to find how information acquisition and the related costs influence voting behaviour in a multiparty setting, and more precisely, how information and its acquisition costs influence the utility of voting; whether there is a threshold to information that varies by individual; and whether already available information has an influence on the individual's willingness to further search for information on candidates' or parties' ideological standings.

This chapter summarizes the methods applied in this thesis, as well as the findings and contributions made and concludes with the limitations of the current study and further possibilities.

10.2.Main findings and contributions

To answer the research questions of the thesis, a mathematical model and experiment are designed. Thus, not only a theoretical answer, but also empirical evidence in support of the hypotheses is given. The mathematical model derives from the works of Triossi (2013) and Ghosal and Lockwood (2009) and shows how an ideologically rational voting choice is made. Information is seen as an important part of the equation because it influences many of the other variables, especially the probabilities of the state of the world and the signals abut the state of the world being correct. Thus, the main research question receives an answer and the hypothesis is proven to hold, at least in theory.

Through the mathematical model it is concluded that information itself has a positive contribution to the gains from voting as it enhances the individual's knowledge not only about the state of the world and the alternatives available, but also about candidate positions, which helps them choose the best ideologically suited candidate. However, it is also shown that

information acquisition costs have a notable negative impact on the utility from voting as they are deducted from the gains from voting for a specific candidate. This theoretically confirms sub hypothesis 1 and brings out the question whether there is a balance point with information acquisition where maximum gains are retrieved with minimal incurring costs.

As Downs (1957) stated, as long as the gains are higher than the costs it will be rational to acquire information to make a better voting choice. This is mathematically expressed through the optimal amount of information acquired and theoretically confirms sub hypothesis 2 and 3. Sub hypothesis 3 receives further theoretical confirmation in the Predictions-chapter. However, the most definitive answers to it are found in the experiment, as it is shown that some individuals behave differently due to their personal predispositions towards the received signals on the ideological proximity of a candidate.

The pilot experiment, especially through the comparison of individual decision-making patterns, confirms the hypotheses stated to answer the research questions. Even though the results are not definitive due to the experiment being a small sample sized pilot, some consistencies with the literature can be found. Through a comparison of average information acquisition, distances to the candidate chosen and payoffs per round in Figure 1, it was seen that payoffs do increase with increase in information, which is in line with sub hypothesis 1 and the literature (e.g. Martinelli, 2007). From the survey answers it was seen that many were mindful of the costs of information acquisition and therefore did not choose to acquire information after a certain "good enough" information piece was retrieved. This evidence, together with a specific individual example of participant 2's high overall information retrieval numbers and low average payoffs suggest that there is a threshold for acquiring information, which may vary from one voter to the other.

Finally, the results of the experiment showed that contrary to the probabilistically rational choices, there was a difference of signalling in the initial distance treatments where the individual had information on one candidate's proximity to them. Only when the ideological distance was stated to be 4-points did the voters choose not to look for information, even though they shouldn't have in either of the cases if probabilities were to be consulted. This behaviour

confirms sub hypothesis 3. Additionally, as there was no information available to the voters on candidate distribution along the ideological axis, the results are in line with previous findings on ambiguity aversion literature (e.g. Fox &Tversky, 1995; Atanassi et al., 2014).

Overall, this thesis investigated the little studied field of decision-making in a multiparty system, where there is more information and choice available. Although the results align largely with the findings of previous research in two-party systems, because of the increased amount of information it is harder and costlier to stay fully informed. Therefore, the voters rely more heavily on signals they already possess, which brings about other than economic rational incentives to vote.

10.3.Limitations

Generally, even though there seems to be evidence to back some of the theory, the findings from the pilot experiment are not conclusive. The biggest consideration is that the sample size is very small. That is why the experiment is considered as a pilot, the purpose of which is to examine whether the approach to the issue is valid. Next, there is a treatment introduced of a heterogenous or homogenous electorate which did not contribute much to the results, as it overlapped with the initial information treatments. The electorate treatment could have had more effect if the participants were informed about the different treatments and their outcomes were dependent on their preferred candidate being elected. However, that could have brought in some strategic considerations and affect the ambiguity-related behaviour. The ambiguity could be lessened with information on distribution, which would bring more meaning also to the different number of candidates available in the different treatments. Overall, it could be said that although there were three different treatments only one seemed to have influence on behaviour due to the experiment design. However, the current design does increase ambiguity-related behaviour.

Additionally, there are some asymmetries in the sample. The observation points in the treatment with no information are more in number, and even this number is not enough to draw generally acceptable conclusions from. In hindsight it would have been enough to have only 2

rounds for the no information treatment in which the party numbers would have differed to make the observations equal, especially as the party size treatment was not that influential.

Even though there are limitations due to the narrow scope of the study and the design of the pilot experiment, this thesis lays the grounds for a further, more detailed study into the initial stages of decision-making not only in the field of voting, but also other relatable fields where there is a multitude of choices from which to select the best suited, rational option.

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Appendix 1 – Experiment instructions and practise round

Experiment instructions

Thank you for participating in the experiment! Your answers will be anonymous, and the results will be analysed and used for completing a Master's thesis. At the end of the experiment one of the rounds will be selected at random and one participant, again selected at random, will receive their earnings in cash, the rest will receive their earnings in chocolate.

In this experiment you will play a practise round and 8 actual rounds. In each round you will be asked to vote for one candidate. To vote for the candidate please write clearly the letter of the candidate in the designated space.

You will be given your own position and one candidate's position on an ideological axis. The unique ideological distance value between you and the candidate is given under the line. The maximum distance between you and a candidate can be 10, and the minimum – 1. You have the opportunity to purchase additional information about other candidates' positions at the cost of 1€ per information piece. The additional information is inside the envelopes. If you open an envelope you must count it as information purchased.

Your payoffs for each round are calculated using the following equation:

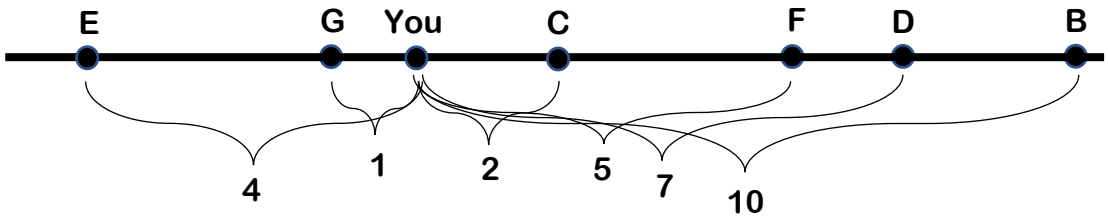
$$(10 - X) - (1\ x\ Y)$$

where X is the distance value between you and the chosen candidate and Y is the amount of information you retrieved. Remember to calculate your earnings for each round and transfer your payoff amount on the payoff slip.

After completing all the rounds, please fill in the survey.

Practise round

You are given your position and the position of all six candidates on an ideological axis. Please circle the candidate you choose to vote for and calculate your payoff.



<u>Your payoff</u>

Formula:

X = the ideological distance

Y = the amount of information retrieved

$$(10 - X) - (1\ x\ Y)$$

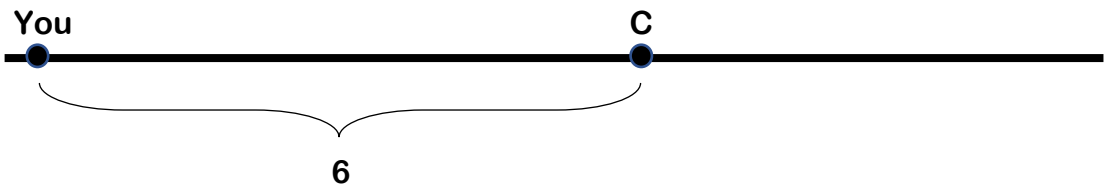
(10 -☐) – (1 x☐) = _____

_____

Appendix 2 – Example of a round with initial distance 6 (5 parties treatment) and additional information

Participant ID:_____

Your ideological axis



There are altogether 5 parties in this election – B, C, D, E and F. Please vote for one of these below.

Your vote ☐

Your payoff

Formula:

X = the ideological distance

Y = the amount of information retrieved

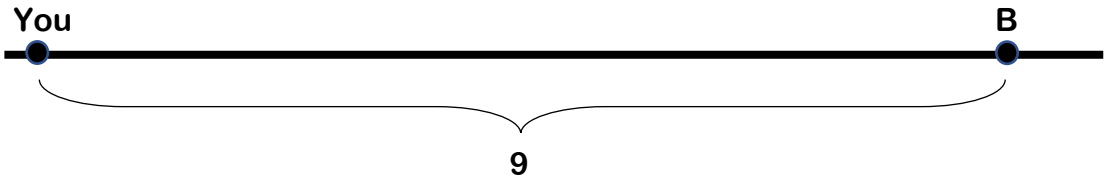
$$(10 - X) - (1\ x\ Y)$$

(10 - ☐) – (1 x ☐) = _____

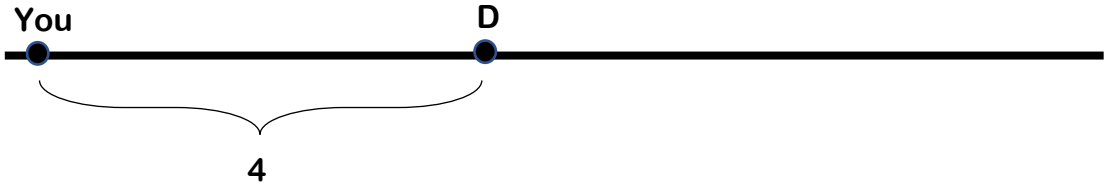
_____

Ideological axis (additional information)

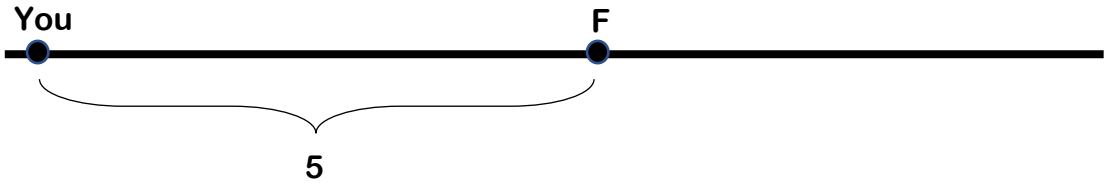
Ideological axis (additional information)



Ideological axis (additional information)



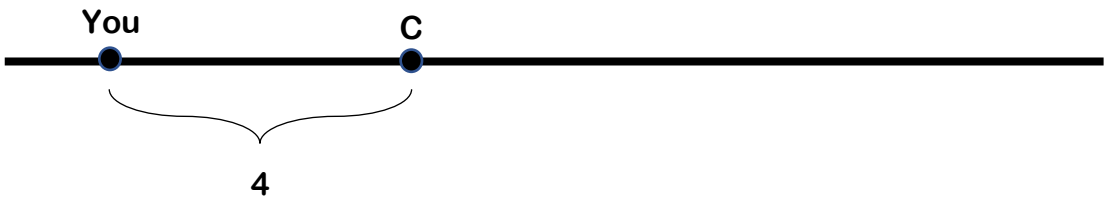
Ideological axis (additional information)



Appendix 3 – Example of around with initial distance 4 (7 parties treatment) and additional information

Participant ID:_____

Your ideological axis



There are altogether 7 parties in this election – B, C, D, E, F, G and H. Please vote for one of these below.

Your vote ☐

Your payoff

Formula:

X = the ideological distance

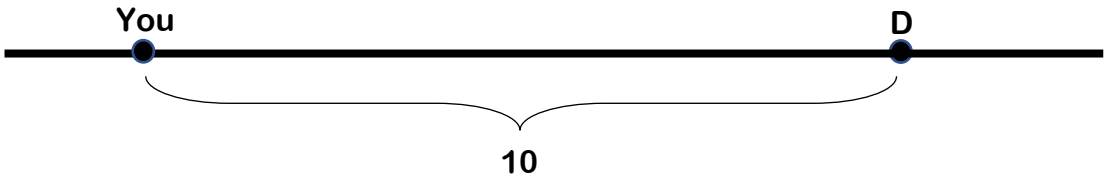
Y = the amount of information retrieved

$$(10 - X) - (1\ x\ Y)$$

(10 - ☐) – (1 x ☐) = _____

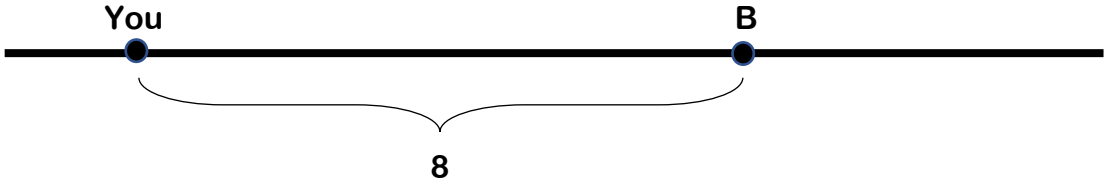
_____

Ideological axis (additional information)

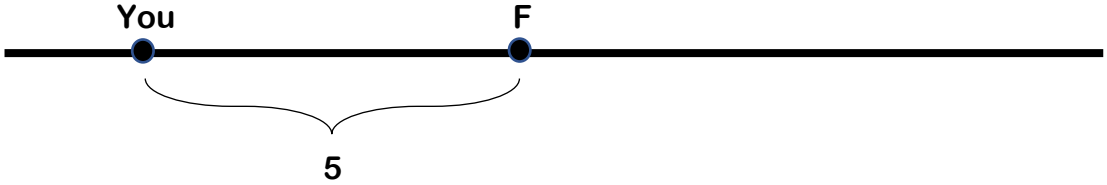


Ideological axis (additional information)

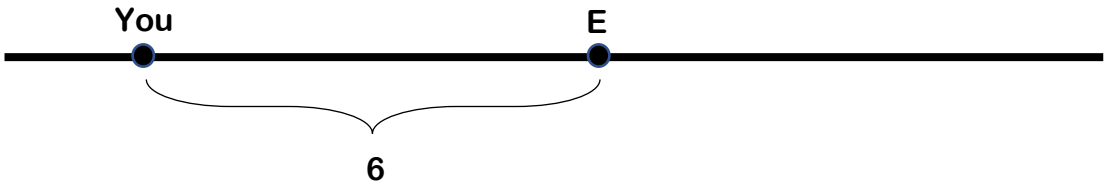
Ideological axis (additional information)



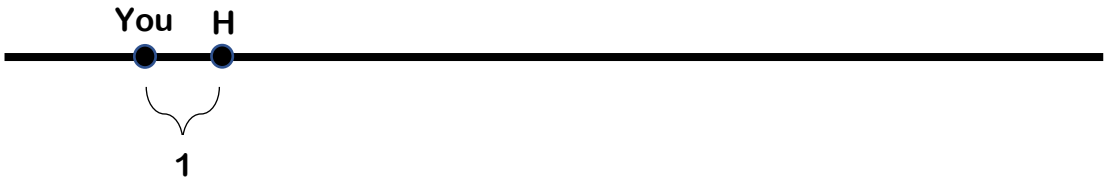
Ideological axis (additional information)



Ideological axis (additional information)



Ideological axis (additional information)



Appendix 4 – Example of a round with no initial distance information (5 parties treatment) and the additional information

Participant ID:_____

Your ideological axis

There are altogether 5 parties in this election – B, C, D, E and F. Please vote for one of these below.

Your vote ☐

Your payoff

Formula:

X = the ideological distance

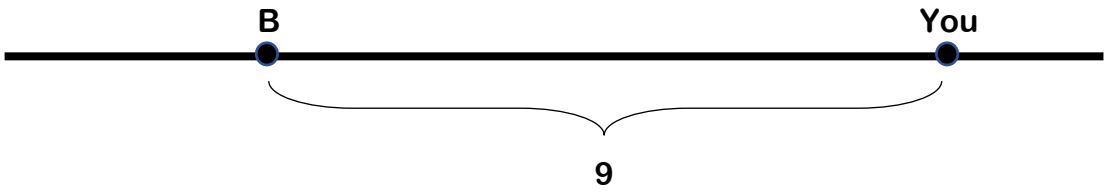
Y = the amount of information retrieved

$$(10 - X) - (1\ x\ Y)$$

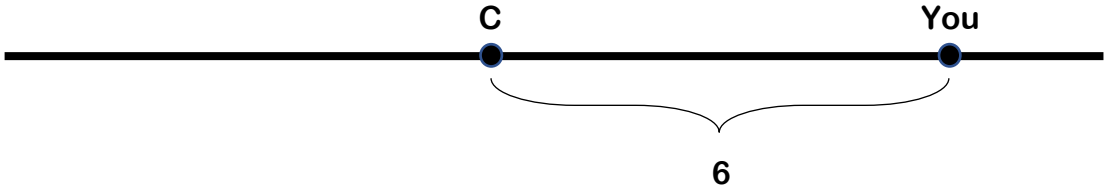
(10 - ☐) – (1 x ☐) = _____

_____

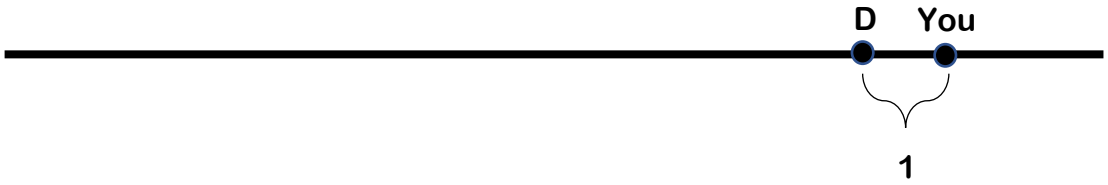
Ideological axis (additional information)



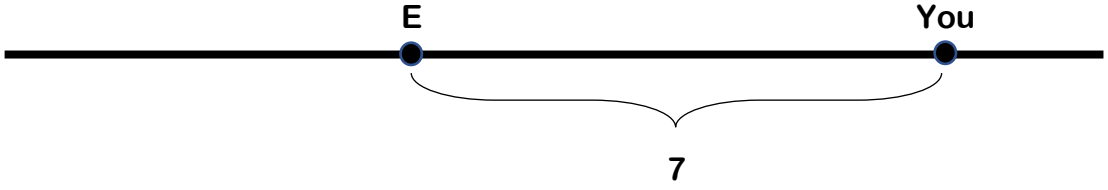
Ideological axis (additional information)



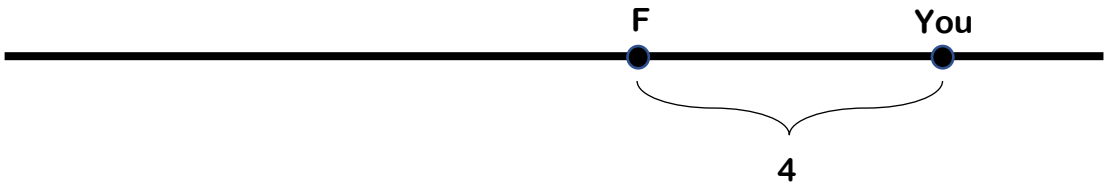
Ideological axis (additional information)



Ideological axis (additional information)



Ideological axis (additional information)



Appendix 5 – Survey

Participant ID:_____

Survey

Please fill in the spaces or select the correct option.

1. Your age

   _____

2. Gender
   a. Female
   b. Male
   c. Other / do not want to specify

3. Home country

   _____

4. Level of current studies
   a. Bachelor
   b. Master
   c. PhD
   d. Exchange student
   e. Not a student

5. Study programme (if relevant)

   _____

6. In this experiment, how did you play? What motivated the choices you made?

   _____

   _____

   _____

   _____

7. How often do you usually vote in political elections
    a. Always when possible
    b. Sometimes when the election interests me (specify your interest)

        _____

    c. Never
    d. I cannot vote
    e. Other (specify)

        _____

8. Do you search for information about parties or candidates
    a. Yes, every time I vote
    b. Yes, sometimes when I vote
    c. No, never when I vote
    d. No, I don't vote
    e. Other (specify)

        _____

9. Where do you get your political information from
    a. Media (traditional and social)
    b. Friends and family
    c. I search for information on the Internet
    d. I speak with political experts and candidates
    e. I don't need information
    f. Other (specify)

        _____

Appendix 6 – Payoff Slip

Participant ID: _____

Payoff Slip

Round	Payoff
Practise round	
Round 1	
Round 2	
Round 3	
Round 4	
Round 5	
Round 6	
Round 7	
Round 8	

Appendix 7 – Results

Survey and round-specific data

ID	Age	Female	Country	StudyLvl	StudyProgr	Motivation	VoteFreq	InfoFreq	InfoSource	Practice	Party1	Pay1	Info1	Dist1	Vote1	Party2	Pay2	Info2	Dist2	Vote2	Party3	Pay3	Info3	Dist3	Vote3	Party4	Pay4	Info4	Dist4	Vote4	Party5	Pay5	Info5	Dist5	Vote5	Party6	Pay6	Info6	Dist6	Vote6	Party7	Pay7	Info7	Dist7	Vote7	Party8	Pay8	Info8	Dist8	Vote8
1	32	1	Finland	1		Tried to get the best information for as little money spent as possible Think got pretty lucky most of the time, tried to be happy with anything over 5.	1	1	3	9	5	3	3	4	D	5	5	1	4	C	7	8	1	1	B	7	5	2	3	G	5	8	1	1	C	5	6	3	1	D	7	7	2	1	C	7	7	1	2	G
2	20	1	Spain	4		Tried to choose the greatest number but taking the least risk possible	1	1	1,2,3	8	5	5	3	4	D	5	3	4	3	B	7	8	1	1	B	7	4	3	3	G	5	7	2	1	C	5	4	4	2	D	7	8	1	1	C	7	2	3	5	F
4	21	1	Japan	4		Didn't expect getting a candidate with nearest position. Instead tried to find someone who is nearer than 5. Tried not to open more than 3 envelopes.	5	2	1,2	8	5	7	1	2	E	5	5	1	4	C	7	8	2	1	B	7	6	0	4	C	5	6	1	3	B	5	6	2	2	B	7	7	1	2	D	7	3	3	4	E
5	21	1	Korea	4	Education	Considered the numer of candidates(5 or 7) and also thought no one can exactly have the same opinion with self. So just usually made a desicion right away iif already knew he first candidate was under 4	1	2	1	9	5	4	4	2	E	5	6	0	4	C	7	3	3	4	F	7	6	0	4	C	5	8	1	1	C	5	7	2	1	D	7	3	2	5	H	7	8	1	1	D
6	22	1	Korea	4		If got 1-3 chose it right away. If got higher than 3, opened another envelope until got an okay number	2	1	1,3	6	5	7	1	2	E	5	3	4	3	B	7	7	1	2	E	7	4	3	3	G	5	8	1	1	C	5	7	1	2	D	7	5	4	1	C	7	7	1	2	D
7	20	1	China	1		Try to maintain the payoff more than 5. No idea about the motivation, maybe want to earn at the average level.	2	2	1,3	6	5	5	3	2	E	5	5	1	4	C	7	6	2	2	E	7	6	1	3	G	5	6	1	3	E	5	6	1	3	E	7	4	4	2	C	7	5	2	3	E
8	25	1	Finland	2	Lifelong learning and education	If the first candidate or clue was 3 or lower chose it. Tried not to take many clues	1	1	1,2,3	9	5	7	1	2	E	5	6	0	4	C	7	3	3	5	D	7	6	0	4	C	5	7	1	2	D	5	6	2	2	B	7	6	1	3	B	7	5	3	2	B
9	27	0	Finland	1	Lifelong learning and education	Tried to use as few tips as possible but still wanted to get closer than 5.	1	1	1,2,3	9	5	3	1	6	C	5	6	0	4	C	7	7	2	1	B	7	6	0	4	C	5	7	2	1	C	5	6	3	1	D	7	4	2	4	E	7	6	2	2	G

Averages of payoff, information acquired and ideological distance to the chosen candidate

Round	Treatment	Averages	Info	Dist
1	1	5.125	2.125	3
2	1	4.875	1.375	3.75
3	1	6.25	1.875	2.125
4	1	5.375	1.125	3.5
5	1	7.125	1.25	1.625
6	1	6	2.25	1.75
7	1	5.5	2.125	2.375
8	1	5.375	2	2.625

Results by initial distance information

ID	Party1	InitDist1	Pay1	Info1	Dist1	Vote1	Party2	InitDist2	Pay2	Info2	Dist2	Vote2	Party5	Dist5	Pay5	Info5	Dist5	Vote5
1	5	6	3	3	4	D	5	4	5	1	4	C	5	0	8	1	1	C
2	5	6	5	3	4	D	5	4	3	4	3	B	5	0	7	2	1	C
4	5	6	7	1	2	E	5	4	5	1	4	C	5	0	6	1	3	B
5	5	6	4	4	2	E	5	4	6	0	4	C	5	0	8	1	1	C
6	5	6	7	1	2	E	5	4	3	4	3	B	5	0	8	1	1	C
7	5	6	5	3	2	E	5	4	5	1	4	C	5	0	6	1	3	E
8	5	6	7	1	2	E	5	4	6	0	4	C	5	0	7	1	2	D
9	5	6	3	1	6	C	5	4	6	0	4	C	5	0	7	2	1	C
11	7	6	8	1	1	B	7	4	5	2	3	G	7	0	7	1	2	G
12	7	6	8	1	1	B	7	4	4	3	3	G	7	0	2	3	5	F
14	7	6	8	2	1	B	7	4	6	0	4	C	7	0	3	3	4	E
15	7	6	3	3	4	F	7	4	6	0	4	C	7	0	8	1	1	D
16	7	6	7	1	2	E	7	4	4	3	3	G	7	0	7	1	2	D
17	7	6	6	2	2	E	7	4	6	1	3	G	7	0	5	2	3	E
18	7	6	3	3	5	D	7	4	6	0	4	C	7	0	5	3	2	B
19	7	6	7	2	1	B	7	4	6	0	4	C	7	0	6	2	2	G
21													5	0	6	3	1	D
22													5	0	4	4	2	D
24													5	0	6	2	2	B
25													5	0	7	2	1	D
26													5	0	7	1	2	D
27													5	0	6	1	3	E
28													5	0	6	2	2	B
29													5	0	6	3	1	D
31													7	0	7	2	1	C
32													7	0	8	1	1	C
34													7	0	7	1	2	D
35													7	0	3	2	5	H
36													7	0	5	4	1	C
37													7	0	4	4	2	C
38													7	0	6	1	3	B
39													7	0	4	2	4	E

Appendix 8 – Welch's t-test results

Interaction between information retrieved	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8
Round 1	t = 1.0121, df = 12.895, p-value = 0.3301	t = 0.4714, df = 12.226, p-value = 0.6457	t = 1.5355, df = 13.901, p-value = 0.1471	t = 1.8614, df = 8.895, p-value = 0.096	t = -0.21822, df = 13.543, p-value = 0.8305	t = 0, df = 14, p-value = 1	t = 0.22771, df = 12.922, p-value = 0.8234
Round 2		t = -0.7521, df = 10.239, p-value = 0.4689	t = 0.32691, df = 13.388, p-value = 0.7488	t = 0.20233, df = 8.0506, p-value = 0.8447	t = -1.2515, df = 11.624, p-value = 0.2354	t = -1.0121, df = 12.895, p-value = 0.3301	t = -0.91946, df = 10.873, p-value = 0.3778
Round 3			t = 1.3322, df = 11.636, p-value = 0.2083	t = 1.8524, df = 10.935, p-value = 0.09113	t = -0.79772, df = 13.397, p-value = 0.4389	t = -0.4714, df = 12.226, p-value = 0.6457	t = -0.28365, df = 13.852, p-value = 0.7809
Round 4				t = -0.24672, df = 8.6092, p-value = 0.8109	t = -1.8651, df = 13.089, p-value = 0.08474	t = -1.5355, df = 13.901, p-value = 0.1471	t = -1.5072, df = 12.36, p-value = 0.1569
Round 5					t = -2.4944, df = 9.6923, p-value = 0.03244	t = -1.8614, df = 8.895, p-value = 0.096	t = -2.0494, df = 10.294, p-value = 0.06678
Round 6						t = 0.21822, df = 13.543, p-value = 0.8305	t = 0.50918, df = 13.829, p-value = 0.6187
Round 7							t = 0.22771, df = 12.922, p-value = 0.8234

Differences between initial distance-treatments	Initial distance 4	No initial distance
Initial distance 6	t = 1.6599, df = 26.777, p-value = 0.1086	t = 0.30004, df = 29.13, p-value = 0.7663
Initial distance 4		t = -1.5989, df = 21.978, p-value = 0.1241

Differences between party number-treatments	7-party treatment
5-party treatment	t = -0.10646, df = 61.64, p-value = 0.9156

Interaction between distances to candidate chosen	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8
Round 1	t = -1.3416, df = 8.3011, p-value = 0.2153	t = 1.142, df = 13.99, p-value = 0.2726	t = -0.88192, df = 8.7231, p-value = 0.4015	t = 2.2, df = 11.53, p-value = 0.04901	t = 2.1183, df = 9.9226, p-value = 0.06041	t = 0.82842, df = 14, p-value = 0.4213	t = 0.53152, df = 13.7, p-value = 0.6036
Round 2		t = 2.8368, df = 8.2347, p-value = 0.02129	t = 1, df = 13.72, p-value = 0.3346	t = 5.8556, df = 10.356, p-value = 0.0001397	t = 6.6933, df = 12.069, p-value = 2.155e-05	t = 2.4685, df = 8.3111, p-value = 0.03773	t = 2.302, df = 8.7406, p-value = 0.04767
Round 3			t = -2.3684, df = 8.6363, p-value = 0.04314	t = 0.78446, df = 11.347, p-value = 0.4488	t = 0.62169, df = 9.7839, p-value = 0.5484	t = -0.32691, df = 13.987, p-value = 0.7486	t = -0.69782, df = 13.589, p-value = 0.4971
Round 4				t = 5, df = 11.271, p-value = 0.0003739	t = 5.5841, df = 13.031, p-value = 8.783e-05	t = 1.9912, df = 8.7362, p-value = 0.0786	t = 1.7579, df = 9.2929, p-value = 0.1116
Round 5					t = -0.30551, df = 13.156, p-value = 0.7648	t = -1.2034, df = 11.557, p-value = 0.2529	t = -1.7762, df = 12.564, p-value = 0.0999
Round 6						t = -1.0626, df = 9.9435, p-value = 0.3131	t = -1.6699, df = 10.797, p-value = 0.1236
Round 7							t = -0.35514, df = 13.715, p-value = 0.7279

Differences between initial distance-treatments	Initial distance 4	No initial distance
Initial distance 6	t = -2.6128, df = 18.097, p-value = 0.01757	t = 1.0675, df = 23.911, p-value = 0.2964
Initial distance 4		t = 6.3208, df = 45.262, p-value = 1.018e-07

Differences between party number-treatments	7-party treatment
5-party treatment	t = -0.38027, df = 61.943, p-value = 0.705

Interaction between payoffs	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8
Round 1	t = 0.33202, df = 12.737, p-value = 0.7453	t = -1.1633, df = 13.447, p-value = 0.2649	t = -0.36172, df = 10.651, p-value = 0.7246	t = -2.9494, df = 10.1, p-value = 0.0144	t = -1.2631, df = 10.717, p-value = 0.2334	t = -0.42857, df = 13.99, p-value = 0.6748	t = -0.26261, df = 13.573, p-value = 0.7968
Round 2		t = -1.5807, df = 11.319, p-value = 0.1415	t = -0.91423, df = 12.855, p-value = 0.3774	t = -4.2426, df = 12.226, p-value = 0.001097	t = -2.0494, df = 12.922, p-value = 0.06129	t = -0.81572, df = 12.561, p-value = 0.4299	t = -0.58614, df = 11.5, p-value = 0.5691
Round 3			t = 1.0711, df = 9.5233, p-value = 0.3105	t = -1.0857, df = 9.116, p-value = 0.3055	t = 0.30551, df = 9.5733, p-value = 0.7665	t = 0.76732, df = 13.572, p-value = 0.456	t = 0.83581, df = 13.99, p-value = 0.4173
Round 4				t = -3.9942, df = 13.88, p-value = 0.001353	t = -1.3572, df = 13.998, p-value = 0.1962	t = -0.17717, df = 10.49, p-value = 0.8627	t = 0, df = 9.6506, p-value = 1
Round 5					t = 2.5529, df = 13.852, p-value = 0.02314	t = 2.3457, df = 9.9571, p-value = 0.04104	t = 2.2215, df = 9.2253, p-value = 0.05273
Round 6						t = 0.70711, df = 10.554, p-value = 0.4948	t = 0.78087, df = 9.7027, p-value = 0.4535
Round 7							t = 0.12987, df = 13.685, p-value = 0.8986

Differences between initial distance-treatments	Initial distance 4	No initial distance
Initial distance 6	t = 1.005, df = 23.463, p-value = 0.3252	t = -0.5542, df = 25.161, p-value = 0.5843
Initial distance 4		t = -2.24, df = 41.275, p-value = 0.03054

Differences between party number-treatments	7-party treatment
5-party treatment	t = 0.38789, df = 60.42, p-value = 0.6995